MOTORAGE

Vol. XLV. Number 13 CHICAGO, MARCH 27, 1924

Thirty-five Cents a Copy Three Dollars a Year



Consumer Confidence

Consumer confidence is the most valuable asset any business can have. Merchants who are building sound, permanent business, are exceedingly careful to keep always in mind that their success is absolutely dependent on good will.

The dealer who recommends to car

owners that they replace all spark plugs at least once a year is doing the motorist a real favor and is earning his lasting gratitude.

Champion Spark Plug Company Toledo, Ohio

Champion Spark Plug Co. of Canada, Limited, Windsor, Ontario

CHAMPION

Dependable for Every Engine



Champion is the standard spark plug for Ford Cars and Trucks and Fordson Tractors. Recognized by dealers and owners for 12 years as the most economical and ethcient spark plug. Sold by dealers every where.

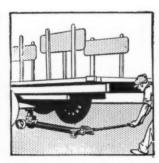


MORE JACKS BETTER JACKS MANLEY JACKS



It reaches under the longest over-hang, from any angle, lifting the heaviest cars.

It operates either with long strokes or short, according to the available space to work in.



Reaches EIGHT FEET under a car—under the longest overhanging body. May be operated from any angle, with handle vertical or way down to the floor. Long strokes or short.



Ask Your Jobber or Write Us

Manley Manufacturing Company York, Pa.



March

\$2

20th to constitute of the cons

Even in a corner against a wall, the Manley Jack works well. Merely use short strokes with handle vertical.



A 2-cent stamp and an idea can win you \$5000

\$200.00 in cash 21 Prizes

Contest closes April 20th. Anyone is eligible to enter.

Winners' names will be announced in this publication as soon as possible. The judges will be the advertising execu-tives of Metal Stamping Company.

ABOUT the easiest money you ever are well over two million in use to-day.

The Lyon End-Fold Parallel Bumper telling some sales methods that have proved particularly successful in selling Lyon Spring Bumpers. There's a \$50.00 cash prize for the best letter. And prizes for the twenty next best too.

There's plenty of profit in pushing Lyon sales. Each sale nets four or five times as much as most accessories. And it's easy to interest customers in Lyon Bumpers. They set the pace in looks, protection and price. That's why there

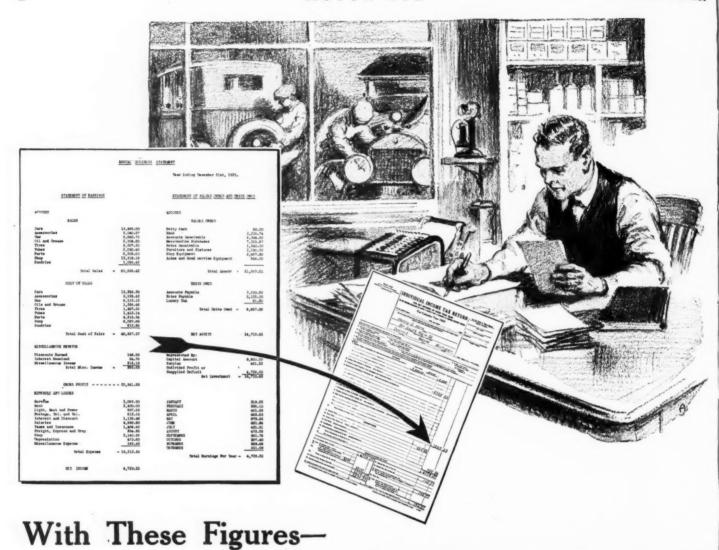
The Lyon End-Fold Parallel Bumper and the Lyon End-Fold De Luxe, two new models, are bound to make Lyons even more popular. They are acknowledged the greatest improvement in bumper appearance and construction since Lyon invented the resilient bumper.

Tell us how you take advantage of Lyon leadership. Get your prize-winning letter in early. April 20th, 1924, is the last day.

METAL STAMPING COMPANY, Dept. 101, Long Island City, New York Canadian Licensee, B. J. Coghlin Co., Ltd., Montreal

RESILIENT LYON BUMPERS

Mai



Income Tax Reports Are Easy!

Profit by the experience of thousands of garage and automobile dealers everywhere. Ask your local Burroughs representative (your banker or phone book will give you the address) to explain how this plan will increase your profits, or mail the coupon and we will send complete information.

The figures required at Income Tax time are exactly the same figures you ought to have every day to conduct your business economically and profitably.

With the Burroughs Simplified Accounting Plan for Garages, it's simply a matter of copying amounts already on your ledgers. The figures are always available! Not once a year, but every day, you know the exact condition of your

business — you have an accurate and complete record of what you owe and what is owed you; sales classified as to new and used cars, parts and labor; cost of sales; cost of labor; value of goods on hand, and every other vital figure fact.

By ending errors, stopping leaks, preventing overstocking, reducing expenses, etc., this plan quickly pays for itself many times over.

Burroughs
Adding
Machine Co.
6133 Second Blvd.
Detroit, Michigan
Please explain how the
Burroughs Simplified Accounting Plan for Garages will
enable me to make more money

Burroughs

Name______Address_____











24

MOTOR AGE Reg. U. S. Pat. Off. Published Every Thursday by

THE CLASS JOURNAL COMPANY

5 So. Wabash Ave. Chicago, Ills., U. S. A.

37 - 1	VI	1

Chicago, March 27, 1924

No. 13

CONTENTS
Profitable Maintenance Is A. E. A. Theme
Hydraulic Brakes and Disc Wheels Standard Equipment on Moon
Teaching the Proper Way to Service Transmissions and Control Sets
Test Bench for Chevrolet Electrical Service
The Right Tools for the Electrical Job
Selling and Installing Accessories for Fords
An Idea Put the Los Angeles Association Ahead 23
Engineering for the Service Man 24
Motor Age's Picture Pages 26
Editorials—
Public Business Is Your Business 28
More Price Increases
Are You Ready? 28 A Business That Will Not Slump 29
News of the Industry—
1924 Bids for New Record
Dimmer Law Logic Is Exploded by Tests
Record Activity in Motor Industry Seen by Bankers 35 Indiana Passenger Car Sales Show Gains During February
G. M. C. Without Set Policy Respecting Accessory Sales 37 Ontario Buys Most Cars. 37
Ontario Buys Most Cars
Here's What Farmer Thinks of Motor Vehicles 38
General Prosperity Is Noted by Paige Executives 39
Business Notes 40 Concerning Men You Know 41
In the Retail Field 42
Coming Motor Events 43
The Readers' Clearing House— High Compression Needs Plugs With Short Center Electrodes 44
Dort Date of Nativity and Chevrolet Oil Con- sumption 44
Business Investigation Is a Good Foundation for the Success of Any Garage
Oakland Wiring, Clutch, Motor and Axle
Installing Flywheel on Mercedes Aviation Engine
Stutz Series R Wiring
How to Make and Use an Ignition Tester 50
Squeeks and Rattles 52
Specifications of Trucks, Tractors and
Passenger Cars 53

Index to Advertisers Next to Last Page

United States,	SUBSCRIPTION R Mexico and U. S. Possess		er year
All Other Coursingle Copies	tries in Postal Union	6.00 p	

Subscriptions accepted only from the Automotive Trade Entered as Second Class Matter Sept. 19, 1899, at the Post Office at Chicago, Ill., under Act of March 6, 1879.

Give them what they expect

"We are well pleased with the Goodrich line and since taking it over have more than doubled our sales. In my opinion the Silvertown Cord meets with the least sales resistance of any standard make—tourists on the road ask for Silvertowns and insist on getting them.

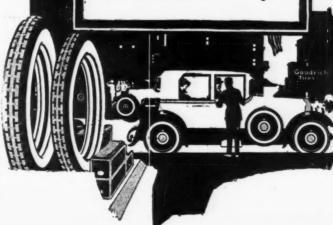
"Silvertowns give wonderful service on the rough roads around Michigan City and once you sell a customer you can look for repeat business. Goodrich is a real quality line and gives the service the customer expects. Our profits are most gratifying."

HOOSIER TIRE SHOP Michigan City, Ind.

Build with Goodrich for Permanency

THE B. F. GOODRICH RUBBER CO.
Akron, Ohio

Goodrich TIRES Best in the Long Run





Multibestos Advertising will appear in these publications

Farm Journal Everybody's
Country Gentleman
Popular Mechanics Munsey's
Ainslee's Love Story
People's Western Story
Detective Story Top Notch
Popular Short Stories

Argosy-All Story

The total number of copies of these publications, printed each issue, totals approximately 4,900,000. The number of actual readers of these publications probably totals 15,000,000 to 20,000,000 for each copy passes through the hands of three to four receive.

A New Business Bringing Idea for MULTIBESTOS Dealers

BY a special arrangement, the famous mapmakers, Rand McNally & Company, are printing for us a new edition of their official series of Auto Trails Maps with a special cover bearing a Multibestos message. The widespread 1924 Multibestos National Advertising is planned to bring a demand for these maps.

While many of the inquiries will come direct to the factory, we believe that most motorists will appreciate being able to secure the maps near at hand. We are accordingly offering to send our dealers these maps at cost. Each map bears space for the dealer to stamp his name and address; or, if desired, we will print same at cost.

Every motorist today wants maps. When he can secure a new, standard, absolutely reliable map for a low price he is quick to respond. And everyone of these maps you sell remains a constant reminder of you and your service. Write us today to send you further information and a *free* sample map of your territory.

DEPARTMENT MA-3

MULTIBESTOS COMPANY

Walpole, Mass., U.S.A.

EXPORT OFFICE-461 Eighth Avenue, New York

NEW YORK 105 West 63rd Street DETROIT 930 Taylor Avenue CHICAGO 1241 Michigan Avenue NASHVILLE 1200 Broadway

SAN FRANCISCO 1035 Polk Street



MULTIBESTOS THE BRAKE LINING

with the Interlocking Weave

The More We Save The More We Give

STUDEBAKER is a quality builder on a quantity basis—today the world's largest producer of quality cars.

Widespread manufacturing economies are thus effected. We spend millions in plants and equipment to save more millions.

We buy in great quantity and we save. We build in great quantity and we save. We embody numerous features found only in cars at twice and more the price of Studebaker. For in quantity production we can afford to give them.

The buyer gets more for his money. More quality, more performance—and that's what he wants.

In the meanwhile, more and more people are finding this out about us. And every month and every day, the world turns more and more to Studebaker.

Compare a Studebaker with a car at twice its price!

LIGHT-SIX

5-Pass.	11	2"	W.	B.	40	H. P.
Touring						\$1045
Roadste	r (3-I	Pass	.)		1025
Coupe-R					ass.	1195
Coupe (5-1	Pas	s.)			1395
Sedan						1485

SPECIAL-SIX

5-Pass. 119"	W. B.	50	H. P.
Touring			\$1425
Roadster (2-P			1400
Coupe (5-Pass	s.) .		1895
Sedan			1985

BIG-SIX

7-Pass.	12	6"	W.	B.	60	H. P.
Touring						\$1750
Speedste						1835
Coupe (2495
Sedan						2685

(All prices f. o. b. factory)

THE STUDEBAKER CORPORATION OF AMERICA

South Bend, Indiana

THE WORLD'S LARGEST PRODUCER OF QUALITY AUTOMOBILES

March

NASH



Only Two Months Old But Already Setting New Nash Sales Records

At the New York Show we said: "the introduction of this new model (the 4-Door Special Sedan) is a decisive stroke well calculated to give Nash dealers a motor car value that is certain immediately to stimulate their sales and widen their market."

Today we can say, the demand for the Special Sedan has grown so vigorously in volume that an unfilled order condition prevails generally throughout the dealer organization.

Again, at the New York Show we wrote: "because of the character of the car (the Special Sedan) plus its remarkably low price it is sure to command a volume of sales twice the size created by the Four-Door Coupe—one of the most rapid selling cars ever marketed by Nash."

The truth of the situation is that the Special

Sedan is being built in numbers that outstrip the greatest output Nash has ever had on any enclosed model and still the purchasing power of the American public is setting so strongly toward this car that dealers are forced to resort to rotation delivery.

The significance of this situation cannot be avoided.

It illustrates vividly the spirited resourcefulness of Nash in developing cars that have an energizing effect upon the rapidity of the dealer's business turnover.

Day by day, and year by year, the Nash dealer contract is becoming a more valuable, more profitable business opportunity.

(2822

FOURS

The Nash Motors Company, Kenosha, Wis.

SIXES



Completely ENGINEERED for BALLOON tires

For over a year Cole has been completely engineered for genuine Balloon Tires.

Cole engineering has always given Cole dealers a decided selling advantage. Cole has again taken the lead in the fine car field.

Over a year's efforts have been fully rewarded. Cole dealers have the *performance* FACTS on balloon tires.

COLE MOTOR CAR COMPANY
INDIANAPOLIS, USA

COLE

There's a Touch of Tomorrow In All Cole Does Today



Vol

The Good MAXWELL

Better to Sell Than to Buck

MAXWELI

The Maxwell-Chrysler line is one of the most powerful, influential and progressive factors in the industry.

Every dealer, everywhere, must reckon with it—either as his own opportunity or as a competitor's.

Maxwell-Chrysler, it is safe to say, is one of the most soughtafter franchises in the automobile world.

The sales field of the good Maxwell is enormous - em-

bracing that great public who seek the utmost in the popular-priced class. The good Maxwell is the greatest value obtainable in this class. Its price and quality leadership is definitely established; its good-will nationwide; its printed, and word-of-mouth advertising, dominating.

The Chrysler Six has created for itself the broadest market in which a single automobile can be sold. People who have heretofore owned the most expensive cars are eagerly buying the Chrysler Six not only for its inherent quality and beauty but more particularly for performance results never before achieved. Yet its price is so reasonable that the Chrysler Six is also drawing unto itself thousands of buyers who have previously paid as much and gotten less.

So completely has the Chrysler Six captured the public that hundreds of buyers,

in large and small communities, actually purchased cars without ever having seen the car itself.

The Maxwell-Chrysler franchise offers dealers a definitely known profit and prosperity. And back of the franchise is a factory policy that is little short of ideal for the dealer.

It is the Maxwell-Chrysler policy to insist that its dealers make money.

It recognizes that in the long run Maxwell-Chrysler will profit only as its dealers profit.

This great and powerful organization has never profited at the expense of dealers—but it has always profited through and with its dealers.

Its aim first, last and all the time is to help its dealers into permanent success. It values their friendship—profits as they profit—and wants above all to keep them in its steadily growing family of successful automobile merchandisers.

Its dealer organization is now expanding with greater impetus. You may have figured on securing the franchise—may want it now. Write or wire for details.

MAXWELL MOTOR SALES CORPORATION, DETROIT, MICHIGAN CHRYSLER MOTOR CORPORATION, DETROIT, MICHIGAN



MOTORAGE



Leaders in the A. E. A. merchandising campaign. Left to right: Arthur R. Mogge, merchandising director; W. E. Wissler, president and chairman of merchandising committee; Wm. M. Webster, commissioner.

Profitable Maintenance Is A. E. A. Theme

BY SAM SHELTON

New Merchandising Campaign to Be Launched Next Week at New Orleans Will Show by Picture and Story How Dealers and Shops May Profit From Sale and Installation of Replacement Parts.

THE spotlight of A. E. A. merchandising activity now turns to maintenance.

The story of profits to be made in the sale and installation of replacement par

The story of profits to be made in the sale and installation of replacement parts is the narrative that from now on will be the subject of the oratorical and demonstrating efforts of the Automotive equipment Association's capable experts on salesmanship.

In session at New Orleans next week the association will hear the report of Arthur R. Mogge, merchandising director, and will view a new motion picture film which the merchandising committee has prepared for the forthcoming campaign. The title of the new picture is "Profitable Maintenance."

It is significant that at this time, after several years of intensive effort devoted to the promotion of merchandising ideas for automotive accessories the A. E. A. turns to maintenance and considers this phase of the automotive business worthy of the best efforts of the manufacturers and jobbers who compose its membership. This subject, therefore, stands out as of extraordinary importance on the program of the annual spring convention of the association which will be held in the southern city from March 31 to April 5. It is noticed that the convention is being held earlier than usual this year, the customary date having been in midsummer. The reason for this change was to accommodate the jobber members, many of whom heretofore found it impossible to attend the midsummer meetings because at that time they were so busy supplying dealers with the automotive merchandise to meet the peak demand.

The vastly increasing number of motor vehicles in operation in the United States provides the fundamental reason, of course, for the profitable maintenance campaign of the A. E. A. Just as Motor Age has pointed out for

Ma

buy

cee

fur

ser

firs

for

job

tak

uni

tro

W

bec

beg

use

fro

wh

the

da

sta

ma

fla

ste

fre

up de st

ta

aı

es

th

m

th

C

p

S

n

many years the automotive repair or maintenance business is of tremendous importance. It is growing and will continue to grow as the number of cars increases. The manufacture of better automobiles and the hammering down of used car prices also result in longer use of cars with consequent demand for more maintenance.

The A. E. A. members, engaged in the manufacture and distribution of automotive parts and accessories, recognize the value of the parts replacement business. They have found the accessory field a profitable one and they do not propose to neglect it. The work that has been done in helping dealers sell more accessories on a profitable basis will be continued through lectures and displays of the "Ask 'Em to Buy" and "Shop Profits" motion pictures.

But now another field is to be intensively cultivated. In his preliminary work consisting of addresses to jobbers and their salesmen Mr. Mogge has been showing by comparison the enormous volume of this field in dollars and cents.

Replacement Sales Double New Sales

For instance, he points out that, although the volume of accessory sales in a year amounts to \$250,000,000, the volume of replacement parts sales is more than double this figure, or approximately \$600.000,000. Then in addition to the sales value of the parts, the dealers and repair shops are called upon to install most of these parts. For this service the retail and service end of the industry collects a sum exceeding the total of both accessory and parts sales, or approximately \$900,000,000.

Thus a double opportunity for profit is presented to the dealer and repair shop, and the merchandising committee of the A. E. A. is urging the dealers to take full advantage of this opportunity. In the first place the maintenance man sells parts. He should carry a reasonably adequate stock of those parts for which he has greatest demand and he should have close contact with a distributing organization upon which he can rely for prompt service in case of emergency.

In this connection Mr. Mogge calls attention to the advantage of the dealer's purchasing from a fairly small number of well established sources. He shows that the dealer who buys his merchandise hit and miss from first one and then the other probably is not considered a good customer by any of his sources and therefore is not so apt to get good service as is the dealer who becomes a regular and consistent buyer.

The selling of merchandise, however, is only one part of the maintenance man's job. He also sells a service which is the result of labor performed in the installation of repair parts. This service also is rendered in connection with the installation of accessories and in certain maintenance operations which do not require the replacement of parts, such as adjustments, inspections and the correction of certain conditions. By far the greatest part of the labor service, however, is rendered in connection with repairs which involve replacements.

The maintenance man, therefore, keeps a shop and tools and employs mechanics for the purpose of performing labor operations on motor vehicles. He has capital invested in order to maintain this facility and he carries a constant overhead or expense of continuing in business. Hence he is entitled to

MERCHANDISING COMMITTEE OF THE A. E. A.

Following is the personnel of the merchandising committee which will have charge of the A. E. A.'s new campaign for profitable maintenance:

- W. E. Wissler, Herring Motor Co., Des Moines, Ia., Chairman.
- N. H. Oliver, Metal Specialties Co., Chicago, Vice Chairman.
- R. A. Stranahan, Champion Spark Plug Co., Toledo, O. L. A. Safford, McQuay-Morris Mfg. Co., St. Louis, Mo. R. W. Proctor, Black & Decker Mfg. Co., Baltimore,
- N. F. Ozborn, Ozborn-Abston & Co., Memphis, Tenn. Arthur C. Storz, Storz-Western Automobile Supply Co., Omaha, Neb.

This is one of the most important committees of the A. E. A. and is the one whose activities bear most directly upon the welfare of the automotive dealer and maintenance man.

OUTLINE OF A. E. A. CONVENTION PROGRAM

Following is an outline of the program of the spring convention of the Automotive Equipment Association to be held next week at New Orleans:

Monday, March 31

Day devoted to meeting of the Board of Directors and com-

Tuesday, April 1

10 A.M. First general session.

Election and installation of new members. President's address.

Commissioner's remarks.

Formation of the house and appointment of committees.

Commissioner's report.

No afternoon session.

Wednesday, April 2

10 A.M. Divisional meetings. Jobbers in Gold room of Roosevelt Hotel; manufacturers in ball room.

11:30 A.M. Merchandising Committee meeting. 11:30 A.M. Months afternoon session.

Thursday, April 3

10 A. M. Divisional meetings, same places as on Wednesday. No afternoon session.

Friday, April 4

10 A. M. Second general session, devoted to merchandising department. Address by Chairman Wissler; address by Arthur R. Mogge, director; showing of "Profitable Maintenance" film; address by H. Kirkland; address by George Brusch; talks by dealers.

2:30 P.M. Regular order of business.

No session on Saturday unless called to dispose of matters left over from Friday.

The entertainment program includes automobile tours of the city, boxing, cards, dancing, a steamer ride, golf and

make a profit from the service he sells just the same as he is from the merchandise he sells.

And it is this story of profit-reasonable profit-that is at the bottom of the new merchandising campaign which the A. E. A. will launch next week and which will be told in the two reels of motion picture entitled, "Profitable Maintenance."

This new film is of the animated cartoon type, being in this respect a distinct departure from the posed movies used heretofore in the A. E. A. merchandising campaigns. The introductory titles show in a few words the immense possibilities in the maintenance field as a result of the rapid increase in the number of cars in operation.

One of the titles emphasizes the fact that there are now more than 15,000,000 motor vehicles in use in the United States. It is pointed out that when cars are new they provide the means for extra profits from the sale of accessories and equipment, but that as they grew older in point of service they require renewals and replacements largely in proportion to the mileage delivered.

These renewals, it is stated, provide an opportunity for the maintenance man to make profits from two sources: First from labor, and second, from parts. That is, he not only has the opportunity to sell parts but also to sell the service, or labor, incidental to installing these parts.

Double Danger Presented

But this double opportunity for profit also presents a double danger for the man who strives to build up a satisfied clientele. In the first place the good work that he does can be spoiled by the use of inferior parts, and in the second place good parts will not give satisfaction if not properly installed. The point is made in the story that dependable parts and modern equipment are both necessary to satisfactory and profitable maintenance.

Proceeding with the development of the general theme the picture shows the Newlyweds purchasing a new car and a goodly outfit of useful accessories which the enterprising dealer asks them to buy.

A year having passed, the picture next shows Mr. and Mrs. loading up the old car for a tour. Starting out they encounter a rough road and a spring breaks just as they pass in front of the Jypem Cut Rate Auto Parts store. The driver buys some cheap parts and after the repair is made he proceeds.

In a short time the car begins to fall to pieces and when further progress is impossible the owner telephones for a service truck. Again he fails to use discretion, getting the first available service station without regard to its reputation for quality of service. When he asks for a price for the repair job he gets the typical reply:

Picture Shop Owner's Trouble

"Can't tell you that right now until I see how long it will take to get the parts and I can't tell you when you'll get it until we've finished it."

There follows the pictured story of the shop proprietor's troubles in getting the parts, his various sources of cut-rate supply failing to have them, or sending the wrong parts. When the job is finally completed the bill staggers the owner because of its size, but he pays and goes his way, his vacation beginning to become sour.

The car breaks down again, due to the poor quality of parts used and the inferior work. This time it happens right in front of a road sign advertising the Modern Service Station, which is only a mile away. Putting in a call for road service the owner is surprised by the prompt response of an up-to-date service truck. When the car is taken into the service station the manager looks it over, asks for a short time to make an inspection of the repairs needed and then quotes a flat rate for the job and promises that it will be completed at a specified time. This service station proprietor is shown getting in touch with jobber, ordering the parts not in his own stock, which are of the quality kind and are shipped promptly from an adequate stock.

It develops that this service man has found that many cars pass his way for which no authorized dealers are in that territory to supply parts and service. He has found that these cars provide a big source of revenue if he is prepared to service them properly.

Of course the owner and his wife are delighted when the car is finished on time and the bill is exactly the amount quoted in advance. They go on their happy and thereafter they recommend this place to their friends.

The shop is shown to be prospering and the proprietor declares: "My profits have certainly increased since I installed modern equipment and made an effort to develop the maintenance business."

Two factors of extreme importance to the maintenance man are recognized in this campaign. One is the practical utility of the Flat Rate in the sale of service and the other is the absolute necessity of handling dependable parts.

The second factor is crystallized in this phrase which Mr. Mogge has coined to describe this particular phase of his campaign:

"It pays dealers to buy dependable merchandise from an established source of supply."

Defining the phrase, he declares dependable merchandise means that which is manufactured by an established organization, whose trade mark it bears as assurance of quality and who will stand behind it.

Although this story will be told at New Orleans primarily to jobbers and manufacturers, it is one that all dealers should hear. And undoubtedly the jobbers who hear it will school their salesmen in it and thus the story will be carried on to the dealers and shops throughout the country.

Other customary features of the A. E. A. summer meetings, such as reports and group meetings, will be carried on at this convention, which has been very completely arranged for by Commissioner William M. Webster and an efficient committee of New Orleans jobbers and manufacturers. The program, however, has been so arranged that the visiting members and their families will have ample time for recreation and inspection of points of interest in the old French city of the South.

A Strong Association Record

By C. M. Glover, Secretary, Santa Barbara Automobile Trade Association

THE Automobile Trade Association, of Santa Barbara, California, is entering upon its eighth year of successful endeavor. It has always been a unit of the state organization, and the present secretary has been in charge of its affairs for seven years. The members hold a monthly dinner at one of the leading hotels, and matters of value to members are freely discussed.

The state organization has frequently cautioned its members against allying themselves with so-called clubs of automobile owners who seek discounts for their members. Dozens of such organizations prey upon the public, and are a constant source of trouble to business men who conduct their affairs along proper lines. Usually they last but a short time, and are the means of taking much money in membership fees out of a community.

Santa Barbara motor car dealers handle their second-hand cars through a Certified Used Car Market that has proved its worth many times over. It would be a difficult job to get any of the dealers to go back to the old practice of bidding against each other on trade-in stuff. The manager of the market appraises every car offered in ex-

change for a new automobile, and the dealer adheres to such appraisal if the car is accepted on a new model.

Santa Barbara is not to be compared with the average beach city. It is often referred to as the Newport of the Pacific coast, and the number of wealthy men who have erected mansions and make their winter homes in its environs calls for high-class lines of motor cars.

To give some idea of this clientele it might be mentioned that three men of wealth, one from Chicago, one from Detroit, and one from New York, each has three separate establishments within a short distance of the Mission city. Each has a wonderful home in Montecito, a near-by suburb; a cottage costing many thousands of dollars at Sandyland, on the ocean front but ten miles distant, and a mountain lodge at the crest of the Santa Ynez range, some three thousand feet above and overlooking the ocean, valleys and islands, some thirty miles off the coast.

These beach cottages and mountain lodges are as sumptuously fitted up as any handsome city residence, and each has cost a big sum of money. These men maintain establishments calling for the use of a number of cars that are constantly active, although the owners pass but a part of the year in Santa Barbara. Many other wealthy folks find enjoyment in the city by the sea whose climate the year round reminds one of spring.

Display Board Attracts

A display which attracted much attention at the automobile show held in St Louis recently was a display board exhibiting the results of the follow up system used by the Wilson Motor Car Co., Dort, Haynes and Case distributor, in St. Louis, to determine the results of service jobs.

A postal card is addressed to the customer shortly after his car is returned to him which asks him if the service was satisfactory, and also asks him in what particular he thought the service could have been improved.

Attached to this card is a return postal addressed to the Wilson Co. which makes it only necessary for the customer to write his observations and drop the card in the mail box. Due to the many reports returned to the company, H. C. Merry, sales manager, says there have been a number of improvements made in their service department.

Mr. Merry points out that there are many minor things which may be overlooked by the company employes but which hit the eye of the customer and his report will result in the elimination of annoying features or the installation of some detail which helps to improve the service.

In addition to this follow up system the Wilson company addresses a letter to the buyer of a new car within a short time after he drives the car away, advising him to bring the car in for any adjustments which may be necessary.

Mai

of t

fed nec

pis

res

nul

res

pu

me

ch

th

va

nie

ste

sti

In

an

Hydraulic Brakes and Disc Wheels Standard Equipment on Moon Series A Special

IFTY per cent of the production of the Moon Motor Car Co., St. Louis, at the present time is given over to the touring car of the Series A, which made its premier showing at the National shows this year. At present this series is divided into two groups, Series A Special and Series A Standard. The former is equipped with disc wheels and four wheel hydraulic brakes as standard equipment and the latter upholstered in black leather with the disc wheels as extra.

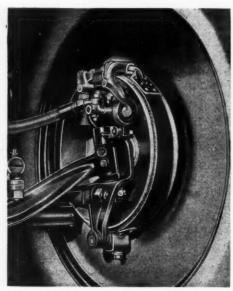
Prices on the two are as follows: Standard, \$1095; Special, \$1295. In Aprix additional body types of the Series A line will be in production, including the following: 3-pass. roadster, 4-pass. brougham and 5-pass. sedan.

No Changes in Body Lines

The five passenger Series A touring car closely resembles the other Moon cars. In the introduction of this New Series there have been no changes in body lines, radiator contour or otherwise. The touring car is finished in marine blue with silvered radiator, and is touched off with a ¾-in. raised moulding extending the full length of the car emphasizing its length. The car is upholstered in genuine leather, French plaited; in the Series A standard models the upholstering is black pebbled, while in the Series A special model it is tan Spanish leather.

The touring car is equipped with a permanent top of long grain, double texture material. This new type top makes possible better tailored curtains and permits of the use of winter enclosures, instead of the usual side curtains; these winter enclosures are being offered by the Moon company for the open models of the Series A standard and the Series A special. The windshield arms are black japanned with nickeled fittings; the upper half of the windshield ventilating.

A cowl ventilator is provided, the regulating mechanism being concealed behind the instrument board and is readily ad-



Close-up of the hydraulic brake installation on the Moon Series A Special

justable from the driver's seat by means of a nickel button.

The instrument board is of hardwood covered with black satin finished metal. The instruments are compactly grouped in the center of the instrument board in three neat glass-covered panels. The instrument bezels are nickel.

The doors of the Series A cars are very close fitting and are equipped with dovetails and rubber bumpers, and double action locks. The outside and inside door handles and all interior hardware are heavily nickeled. The body is constructed of kiln dried hardwoods paneled with silver finished steel.

The front doors are equipped with large convenient pockets, the left front door having a tool compartment. A good sized compartment is located under the front seat and may be used for carrying jack, skid chains, etc. All door sills are protected by aluminum scuff plates and aluminum kick plates are attached to the side aprons at the doors. The floor of

the driver's compartment is covered with a heavy rubber mat, while a heavy horse hair carpet covers the tonneau of the car,

One of the first enclosed cars of the new series to be introduced will be the five passenger, two-door brougham. This is a close-coupled car with doors that are exceptionally wide and front seats so arranged that they can be conveniently moved forward under the cowl, insuring plenty of space for entrance and exit, and providing ample space for luggage, etc.

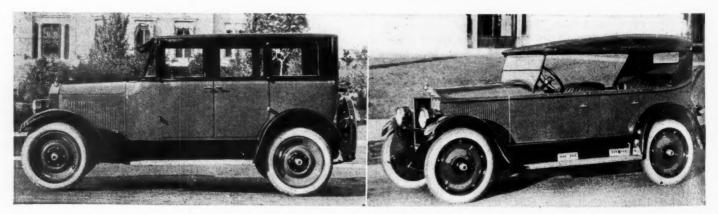
The interior of the brougham is upholstered in dark blue broadcloth and it has a heavy dark blue carpet and curtains to match. The doors are equipped with crank type window regulators and the rear windows being raised, and lowered by means of lifter straps. The interior hardware is nickeled silver, satin finished. The brougham is finished in dark blue with black belt moulding, the superstructure being finished in black.

The Series A Moon is powered with a new Moon-Continental six-cylinder engine. It was designed by Continental Motors engineers in collaboration with Moon engineers, many of the dies, jigs, patterns, and tools used in the manufacture of this engine, being owned by the Moon company.

The engine has 31% in. bore by 41% in. stroke, and on block tests, shows a maximum brake horsepower of 54 at 2500 r.p.m. The cylinders are of the L head type and the crankshaft is mounted on four bearings.

Force Feed Lubrication of Engine

Lubrication is by force feed, wherein oil is drawn from the lower part of the oilpan by a gear pump located on the left side rear end of the crankcase. From the pump the oil is forced to a manifold, or as it is termed, a "gallery tube" located beneath the main bearings, from there through four vertical ducts or tubes the oil is conducted to each of the four main bearings. The arms or throws



The characteristic Moon features are retained in the body types of the Series A. A ¾ in. raised moulding extends the full length of the touring car

of the crankshaft are drilled from each main bearing to the nearest crankpin bearing. Through these holes the oil is fed from the main bearings to the connecting rod bearings. The cylinders and cam shaft bearings are lubricated by the spray of the oil thrown off by the crankshaft throws and lower ends of the connecting rods. In this same manner the piston pin bearings are lubricated.

The oil pump and pressure regulator is accessibly located on the left middle side of the crankcase. The pressure is regulated through the changing of the number of discs between the upper end of the spring and the cap plug in the regulating device.

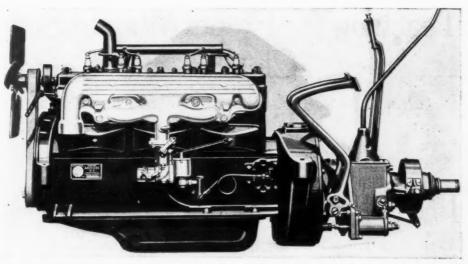
Adjustment of Front End Drive

The cam shaft, generator and water pump are driven from the crankshaft by a Morse silent chain. Means of adjustment are provided for by mounting the generator on the rear face of the chain case in such a manner that it can be swung out away from the crankcase. This movement will increase the distance between the centers of the crank and generator shaft and compensate for any chain stretch or wear.

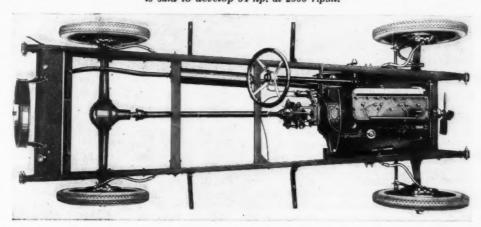
Pistons are cast iron, equipped with three ${}^{A}_{ij}$ in. rings above the pin. The valves are of the alloy steel type, with nickel alloy steel head and low carbon steel stems. The big end bearing construction is known as "spun in" type. In such construction the babbitt lining and the rod blade are integral parts. This also applies to the cap.

The upper halves of the main bearings are removable die cast bushings provided with suitable anchorage bosses and containing screws. The lower halves are as in the case of the big end bearings of the connecting rods, "spun in", that is, the babbitt line is made an integral part of the forged steel caps.

The axles used on the Series A car were designed by Moon engineers and are built by Timken. This applies to both



The powerplant of the Moon Series A. It is a Continental built to Moon specifications and is said to develop 54 hp. at 2500 r.p.m.



The Moon Series A chassis incorporates a frame in which the side rails are straight and of deep section

the front and rear axles. The same type of front axle bed is used on both the two-wheel and four-wheel brake equipped

Other units incorporated in the Series A include Warner transmission, Borg &

Beck clutch, Spicer universals, Ross cam and lever steering gear, Delco starting, lighting and ignition system, and Exide battery.

The wheelbase of the car is 113 in. and the touring weighs 2,410 lbs.

DAN'Z DIARY

Gee some guys ought to a bin in the penetenshury they is so crooked.

A while ago Mr. Pelton brought his Packard in and ill be darned if you wouldent a thought it was coming apart it maid so much noise. Say a thrashing machine couldent a bin heard along side of that bus.

Well i went to work on it me and Art and when we got the pan off what do you think we found—a good big handfull of fine emery powder down in the oil sump with plenty more everywhere they was any place for it to catch.

I told the Boss about it and he sends fer Mr. Pelton and when he seen it he new rite away what was the mater. He had a shofer down at New York last summer and this bird had some work

done and it was 60 bucks and what does he do but take the bill and put a 1 in



front of the 60 making it 160 bucks instead of just 60 wich the servis stashun

had. Well Mr. Pelton has got a bunch of dow but he aint lost his branes getting it so he slips out and telefones the garage and asks them about it cuz he sais the figures is blurred and they tells him 60 bucks

So he goes back and tells the shofer his services would turminate the next Saturday it being thursday then and that being whare he maid his mistake becuz what does that bird do but go out and by a package of emery and dump the hole thing in the crank case.

Gosh after driving that Packard 1500 miles home them bearings was well run in ill say they was, only they was about a 64th of a inch play on all of them and the rings and pistons was pretty near wore out. She pumped oil like a fire engine pumps water.

A guy that would ruin a bootiful engine like that because he got canned fer pulling a crooked deal should ought to be in capacity and they ought to be maid to work for their bourd to.

Teaching the Proper Way to Service Transmissions, Clutches and Control Sets

Gear Company Takes Steps to Carry on Educational Campaigns for Dealers, Service Men and Others to Insure Proper Functioning of Its Units in the Hands of Owners

By B. M. IKERT

In line with the present tendency toward the betterment of service generally, the manufacturers of automotive units are taking steps to carry on educational campaigns whereby mechanics, fleet owners, dealers and service men in general will be taught the proper ways to service and maintain the products of the manufacturers after such products are placed in service.

Manufacturers of automotive units long have realized that one of their outstanding problems is to find some way to combat the evil of neglect and careless servicing of their units. Wrong installation of units by the car and truck maker; selecting the wrong size of unit; poor alignment and assembly inspection are some of the problems so far as the vehicle maker's end of the deal is concerned

Giving the Units a Chance

Naturally a condition like this is reflected in the dealer's business and also from the standpoint of the car owner or truck owner as the case may be. A unit not correctly chosen in the first place and not properly lined up when it leaves the factory naturally is going to give trouble sooner or later when the vehicle wherein it is installed gets into the hands of the buyer. In such a case the service man has little comeback and the unfortunate part of it all is that in most cases the service man cannot intelligently tell what is wrong. A clutch, for example, may be giving trouble and the service man is on the point of installing a new unit, either of the same make or some other make. The chances are that the trouble is not in the clutch itself, but in the alignment of the clutch. No matter how good the units, they cannot perform under adverse conditions.

So, the thing that the makers of units are trying to impress upon the trade generally is that before there is a whole-sale condemnation of their products there shall be a better understanding of the units themselves and the way they must be installed and serviced.

Showing the Mechanics How

As to how such a proposition can be handled we cite the educational campaign which has been put on very recently by the Brown-Lipe Gear Co., under the direction of H. A. Pierce, of the company's Chicago branch. The first of the talks presented by Mr. Pierce was delivered a few days ago to the students of the Greer College of Automotive Engineering, Chicago. The talk dealt pri-

marily with the things the mechanic must know in order to properly service transmissions.

Although Mr. Pierce's talk had to do chiefly with Brown-Lipe units, he covered many points that apply equally to all transmissions, regardless of make. His experience as trouble shooter for the company proved extremely helpful in that it gave the students, who will be tomorrow's mechanics, exactly the things they will encounter when they take positions as service men in the industry. Lantern slides showing sectional views of the various types of transmissions and clutches made all the points referred to clear.

The matter of bearing adjustment received the major consideration in Mr. Pierce's talk. He showed by means of the lantern slides how the adjustments are made and laid particular stress on the importance of making the initial adjustment to the bearings after the vehicle has traveled 1,500 miles. The initial adjustment must be made after the parts have become properly seated and thereafter the adjustments need be made with less frequency, about every 5,000 miles, to be exact.

Adjustments of Bearings

Adjustments of the bearings should be made, the speaker said, to hold them tight enough to prevent preceptible endwise movement of the shafts, when the gears are in neutral position, yet allow of the shafts being easily turned by hand. Mr. Pierce pointed out the damage that easily could result in setting up the adjustment too tight, thereby causing bearing failure. He went into considerable detail as to how a mechanic should go about detecting end play in a transmission shaft and the logical manner in which to proceed with the countershaft and main drive shaft bearings.

The speaker also showed the ill effects encountered by failure to keep tight the bolts which anchor a transmission of the main frame or amidships type. In such a transmission it is necessary that there be sufficient clearance at the front end support or trunnion to take full advantage of the three-point suspension. Mr. Pierce said that in trouble shooting trips he has encountered instances where set screws had been placed in the top and bottom of the trunnion support and these set screws drawn up so tight that the transmission could not oscillate in the support as the maker intended it should.

A portion of his talk was devoted to lubrication of transmissions and in this

he said the dealers and service men should not be led astray by over-zealous lubricant salesmen who try to impress them with the fact that their lubricant clings especially well to the gears. The gears, Mr. Pierce pointed out, are not in need of lubrication as much as are the bearings which support the shafts carrying the gears. If the bearings fail through lack of lubrication or otherwise, the gears do not run on their pitch lines and the result is a noisy transmission and eventual ruination of the parts.

Talk Available for Associations

Very often difficulties encountered in service with transmissions are due to carelessness on the part of the mechanic who does the work. For example, if a mechanic is not careful in reassembling a torn down transmission to get the spring retained ball checks and interlocks properly assembled trouble is bound to result. Frequently, the speaker said, the mechanic misplaces one of the springs of the ball checks and then proceeds to make a spring that is too weak. This results in the gears having a tendency to slip out of mesh.

It is not the intention of the Brown-Lipe company to limit its educational talks on maintenance of its products to schools for mechanics. Dealer organizations, service associations and any similar bodies can avail themselves of these talks, inasmuch as Mr. Pierce is prepared to deliver them at any time upon sufficient notice.

ent notice.

About 150 students attended the first talk at the Greer school during the afternoon meeting and the same talk given by

Mechanic Sometimes at Fault

Mr. Pierce at night drew over 400 students, many of them being machanics, service men and truck drivers, who are preparing themselves for more responsible positions in the automotive industry. The next talk by Mr. Pierce will cover clutches, followed by one on control sets.

In order to impress his hearers on the importance of reassembling the transmission correctly Mr. Pierce cited numerous instances of where he had found mechanics who had neglected to correctly assemble the interlocks, tighten the bearing adjustments too much, used the wrong kind of lubricants and so on. He also spoke of the importance of using the correct tools for pulling gears, clutches, etc., and injected a little humor into his talk by telling of some of his experiences with the "crowbar and hammer type of mechanic."

ger ste Tr

Mo

Che

zat

nat

dov

ger

ma

cle

ple

wii

(16

wil

ne for wi

up ra ne ho

> ne sw

br ro on

te er

Test Bench for Chevrolet Electrical Service

Special Layout Designed Particularly to Meet Needs of This Car Eliminates Guesswork and Cuts Down Time on Repairs. Article Herewith Explains How Various Tests for Grounded and Shorted Armatures Are Carried Out

By J. EDWARD SCHIPPER

A TEST stand designed to speedily and accurately locate generator trouble in the Chevrolet installation has been worked out by the Kent-Moore Organization and approved by the Chevrolet company for its dealer organization. The stand is designed to eliminate guesswork and consequently cut down time on repairs. The complete stand is shown in Fig. 1. As will be noted, it is a very compact arrangement with everything necessary for locating electrical trouble.

Fig. 2 shows the method of making a generator test on this stand. The generator is inspected to see if the brushes make contact, that the commutator is clean and that the connections are complete.

Place generator on block and connect wire (15) to terminal and ground wire (16) to frame of generator. (Do not connect to motor for this test.)

Close switch (14) to right. Generator will then run or "motor."

Now watch ammeter on stand. If generator is O. K. needle will remain steady at approximately 3 amperes. Trouble will be indicated as follows:

Defective Armature

If this condition exists, ammeter needle will vibrate or swing back and forth as armature revolves—or armature will run jerkily.

Ground Field Coil

If coil is grounded ammeter will read more than 3 amperes, although armature will run steadily. If this condition shows up, a further check should be made, i. e., raise third brush off commutator, connect generator wire (15) to third brush holder and note reading which should not exceed 2 amperes.

Ground Brush Holder

This will be indicated by ammeter needle flying clear off scale every time switch is closed.

Main Brush Setting

As well as the third brush, the main brushes (which are the two large brushes, independent of the third or narrow brush), should always be checked on a machine coming in for repairs.

Raise third brush and hold away from commutator. Loosen main brush holders. Fasten generator wire (15) to generator terminal and ground wire (16) to generator frame. Close switch (14) to right.

Armature may be made to rotate in either direction by shifting brushes. Set main brushes so that armature wants to turn in proper direction when given a start with the fingers. Do not set too far—armature should just turn slowly. Then tighten brush holders.

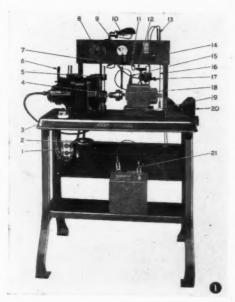
Third Brush Setting

Couple up generator to motor as shown in Fig. 3. Loosen third brush holder and adjust in direction of rotation to increase charging rate.

To determine correct brush setting for each of the three types of Chevrolet generators, refer to table. It is suggested that after setting is made, the generator be given a heat run of about 30 minutes at full charging rate as a final test.

Cut Out Test

Place cut out on plate and connect wire (11) to battery connection on cut



Kent-Moore test stand for diagnosing electric troubles on Chevrolet cars. 1—main fuse; 2—elevating hand wheel; 3—power switch; 4—motor coupling; 5—motor guide; 6—speed control; 7—generator wire to cutoout; 8—tachometer (speed indicator); 9—ammeter; 10—test light; 11—battery wire to cutout; 12—generator clamp screw; 13—test points; 14—battery switch; 15—generator wire; 16—ground wire; 17—clamp lock screw; 18—generator coupling; 19—generator support for (square type); 20—generator support (for round type); 21—battery connections

out and wire (7) to generator connection on cut out.

See that generator is properly connected and is charging correctly.

Open battery switch (14) and start generator slowly until speed is approximately 600 r. p. m. when cut out should close and ammeter should show charging rate not exceeding 1 ampere. See Fig. 4.

Then slowly reduce speed until ammeter shows ½ ampere discharge—when cut out should open.

Note: If when using stand for other tests, no cut out is on plate, snap wire (7) and (11) together or else switch (14).

Ammeter Test

Attach generator wire (15) to one post of ammeter. Hold ammeter in hand with other post touching generator terminal, as shown in Fig. 6. Run generator at 5-10-15 amperes charging rate and compare reading of ammeter being tested with that shown on ammeter of stand.

Table showing ratio of r. p. m. indicated on tachometer of test stand to m. p. h. of car and correct brush settings for all models.

	shows on achom eter		s	490 upe-
Square type auto- lite used on all	1000	9 amps.	13.5	14.5
models up to Jan., 1923.	2000	15 amps.	27.	29.
Type G J	600	Cut in		8.7
Round type auto- lite used on	1000	10 amps.		14.5
Superior model Type 950		16 amps. Cut in		26.1 9.
Remy Used on Superior	1000	10 amps.		14.5
model.	1700	16 amps.		24.6

Note: The r.p.m. at which generator is traveling on stand will show up on tachometer (speed indicator) and the amperage will show on ammeter.

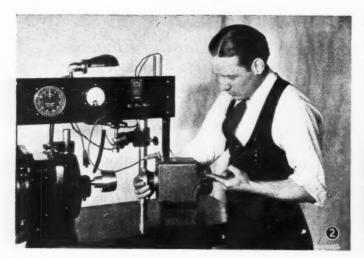
The readings shown in this table are average and with generator cold. A hot generator will read about 2 amperes lower

Armature Tests

The growler or armature tester is not furnished with stand but can be obtained separately. See Fig. 5.

Grounded Armature — Armature is placed in growler and tested for ground

How Tests Are Made on Kent-Moore Test Bench







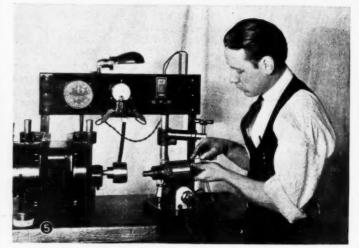


Fig. 2—Setting the main brushes
Fig. 4—Cutout test
Fig. 6—Ammeter test



Fig. 3—Setting the third brush Fig. 5—Armature test

by touching one test point to the shaft of armature and the other to commutator. If lamp lights, armature is grounded.

Shorted Armature—Test for short by holding a flat strip of steel lengthwise with top of armature, turn switch on and rotate armature. If shorted, blade will be attracted to coil.

Open Circuit—To test for open circuit proceed the same as for shorted test. Short circuit each bar of commutator with steel strip. Each bar should have a strong flash. If flash is weak it indicates open circuit.

For long drives and summer touring charging rate should be about 2 amperes less than shown in table.

For ordinary winter driving charging rate should be about 2 amperes higher than shown in table.

Remember that it is impossible to lay down a definite rule due to the varying conditions under which cars are operated, so set brushes according to driving condition of car, working from this table as average.

of It

wor

mus ada shor elect mer repa Inc. are by and

Pro

In whi and essee ble up prin sible moudiar with cial general log

atta to b

serv stan clud a st plac head prov vale: Whii Nort sible

able
A
ing of in the equipolar, election pres
when

Fo desig most

mos

Sme

ther

The Right Tools for the Electrical Job

Cooperation of the Factory Often Makes Available Special Tools Which Speed Up the Work and Turn Shop Losses Into Profits

O-OPERATION between the factory and the dealer is becoming more and more a necessity in this day of high pressure automotive merchandising. The dealer must satisfy the car owner, but to do so he must be able to work efficiently. To work efficiently he must have tools and testing equipment adapted to the work to be done. Who should know better than the maker of electrical apparatus the kind of equipment that should be used in testing and repairing it? The North East Service, Inc., of Rochester, N. Y., feel that they are best qualified to back up the dealer by supplying him with suitable tools, and their catalog tells the whole story.

Provision for Driving Any Generator Up to a Speed of 3000 R.P.M.

In working on generators and starters, which with North East equipment is one and the same thing, a test bench is most essential. The North East bench is capable of driving the machine at any speed up to 3000 R. P. M., the sliding disc principle making this speed range possible. In addition to having adjustable mounting cradles for generators of any diameter up to 7½ inches it is provided with a set of quick clamp fittings especially designed for North East motor generators and ignition units. The catalog gives details as to methods of quickly attaching practically any unit that needs to be driven.

A Test Stand for Speedometers

A testing device not found in many service stations is a speedometer drive stand. Such a piece of equipment is included in the North East line, it having a standard calibrated speedometer and place for driving two other speedometer heads. A driving motor and rheostat is provided so that speeds up to the equivalent of 100 M. P. H. may be obtained. While designed primarily for testing North East speedometers it is also possible to test other makes by using suitable adapters.

A line of small tools suitable for working on electrical units is rarely available in the dealer's shop. In the first place the service department has started by equipping for mechanical work on the car, and then in branching out to handle electrical work, the same tools have been pressed into service regardless of whether they were suitable or not. In most cases they were not.

For this reason the tools especially designed for electrical work should prove most acceptable.

ing

her

lay

ing

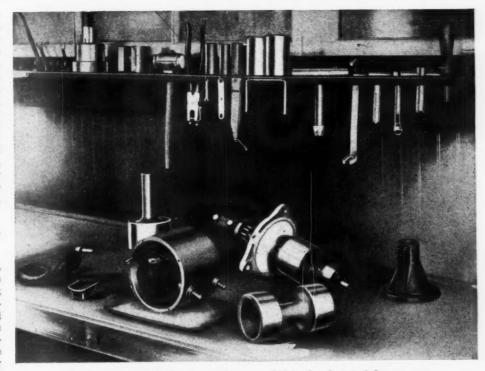
er-

ing

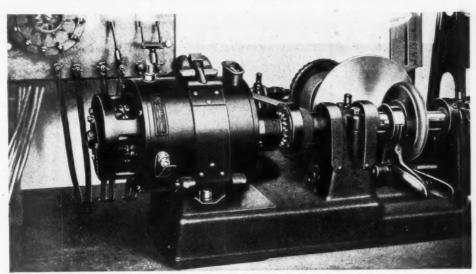
ble

Small Tools Must Be Adapted to the Work to Promote Efficiency

For removing sprockets, for example, there is a strong puller of the split ring



Small tools suitable for the work are needed in the electrical department



It's disappointing to do a job, have the car owner call and then find the generator will not charge. A test bench prevents such unhappy occurrences

type, which in many cases can also be used to remove ball bearings. A set of special tools is available for applying locking collars, bearings and gears in proper fashion, while pole piece spreaders and gauges are available for insuring best results in field coil installation work. The line of tools also includes general tools such as rawhide mallet, eyelet punches and special wrenches. Another useful shop accessory is the bench pad, a leather sack partly filled with sand, which facilitates holding

round units in position while assembling.

The Growler With Adapters Handles Armatures Up to 4½ In. Diameter

A growler and service instruction book are also included in the line of equipment, the growler having adapters so that armatures from 1½ to 4½ inches in diameter may be tested, the operating voltage being either 110 or 220 volts A. C. This equipment is manufactured by the North East Service, Inc., Rochester, N. Y.

dent

ing

deal

In

Ford

Fore

Selling and Installing Accessories for Fords



If space permits it is an excellent plan to locate the accessory and parts department close to the service department. In the above service station the customers must pass the accessory show cases when they enter and leave the building

The Non-Ford Dealers and Service Stations Have Equal Chance Along With Ford Dealers. Display of Accessories and Parts Has Much to Do With Turnover of Stock. Tourist Trade Must Not Be Overlooked

By B. M. IKERT

THE servicing of Ford cars, trucks and tractors aside from the mechanical work involved in the installation of parts is given over to a great extent to selling and installing accesories. About two-thirds of the Ford dealers carry a certain stock of accessories. Most of the service stations doing authorized Ford service also carry a stock of accessories in addition to their regular parts stock. Over one-half of the non-Ford dealers, general repair shops and garages carry accessories for Fords. The large amount of service work annually done on Ford units by concerns not connected with the Ford Motor Co. as expressed in the previous articles of this series is indicative that accessories for Fords offer an opportunity for profits.

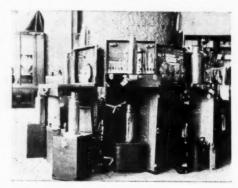
The particular items that may be looked upon as the biggest selling accessories seem to vary as to whether the organization doing the selling and installation is a Ford dealer, service station, non-Ford dealer or general repair shop or garage which also sells accessories and supplies.

A careful survey of the field of Ford service by a competent organization shows that the biggest selling items with Ford dealers are locking steering wheels, bumpers, speedometers, motor temperature indictors and tires.

With the non-Ford dealers the biggest selling accessories are timers, spark plugs, lamp bulbs, transmission band linings, fan belts and tires.

The Biggest Sellers

Timers, spark plugs, transmission band linings, bulbs and fan belts are the biggest selling items with the independent shops, garages and supply dealers.



Don't overlook the possibilities of seasonable accessories.

Reference to the chart herewith regarding the tabulation of Ford dealers, non-Ford dealers and other organizations as regards sales of accessories for Fords shows that the biggest selling items for non-Ford dealers, shops and garages coincide to a great extent.

That the facts concerning the Ford dealers differ from the other two groups is probably explainable on the basis that the articles which lead in sales with these groups are furnished to the Ford dealers by the Ford Motor Co., and unless the article which is being merchandised to Ford dealers involve some patented feature not used in the article furnished by Ford, the Ford dealer cannot sell it. That is why locking steering wheels, bumpers and speedometers, none of which is furnished by the Ford Motor Co., lead the sales of accessories with Ford dealers.

Regarding the amount of stock carried by Ford dealers, and dealers in other cars, as well as independent shops, the accompanying chart based on returns received to a questionnaire will be of interest

The fact that the Ford car comes to the dealer unadorned with accessories 24

and fitments generally found in other makes of cars, obviously presents a fine opportunity for dealers and service stations generally to cash in on the sales of such fitments to Ford owners.

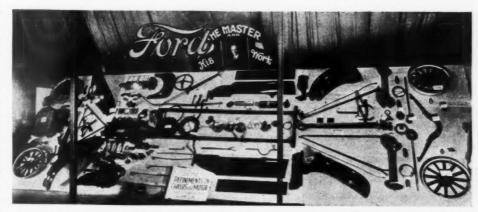
As to the kind of accessories to stock, the table on these pages will be of help for the dealer, non-Ford dealer, independent shop and garage. The table has the additional advantage of showing the possible turnover in accessories during the year. General information concerning the field of Ford service seems to indicate than an annual turnover of stock of five times a year per establishment is a conservative estimate on which to base calculations involving total turnover in the Ford supply field annually.

Business Done by Non-Ford Dealers

One of the accompanying tables covering the Ford dealers, other dealers, shops, garages and supply stores shows the approximate volume of business done in each of these fields on Ford supplies annually at retail.

The big point to note in connection with this table is that of the total business done amounting to about \$551,000,000 a year, the amount done by Ford dealers is a little over \$110,000,000, or only 21 per cent of the total volume of business done.

In figuring a stock of accessories to be carried, and this also holds true of the parts stock it is not sufficient to consider alone the potential number of Fords in the territory or in case of a Ford dealer the size of the car contract. Proper allowance should be made for the tourist trade. This is of special interest to the non-Ford dealer and garage, whose places of business frequently are



One Ford dealer in Kansas City at one time decorated his window with Ford parts calling attention to their engineering features. It made people come in and ask about them

called upon to service the cars of the tourists. In many localities the Ford dealer has only sufficient room to care for the overnight storage for his regular customers and consequently the other garages or service stations get much of the transient trade. For this reason every service station and garage expecting to cash in on the Ford tourist trade must consider the selling and installing of accessories for Fords.

In the March 13 issue of Motor Age the subject of parts replacement was discussed in connection with the article entitled "Parts Replacement Simplifies Ford Service" and much of what was said in that article relating to the proper way in which to merchandise parts, applies equally well to the subject of selling accessories for Fords. In fact, in a good many instances the dealers and service stations combine their parts and accessory departments. This is especi-

ally suited to the smaller establishment where obviously overhead expense is an item to be considered.

Many dealers and service stations find it advantageous to display accessories along with parts and there is no reason why this practice cannot become more general. The motoring public is to a large extent interested in the parts that go to make up a car and if these parts are neatly displayed either in the window or counter they will attract attention and the presence of their display will give to the observer an excuse for coming in to ask questions, opening the way for a conversation that may result in a sale of parts, accessories or maintenance work of some kind.

The Ford an Engineered Product

Along this line a Ford dealer in Kansas City at one time placed in his windows a number of Ford parts in which



A well arranged parts and accessory department. Everything is in sight and the arrangement is such that sales can be made with disputch. Note the price card holder on top of the show case, which enables the salesman to quickly ascertain the price and location of any part

reers, ons ords for

ord

ups
that
with
ord
less
ised
nted
hed
l it.
eels,

carther the re-

Co.,

s to

And

gai

par

wh

sal

dra

80

sel

big

100

sta

pl

lir

C

pa

ca

sh

fo

ca m:

ite

pr

m

ne

changes had been made. The sales purpose of the display was to demonstrate that the Ford car is an "engineered product" instead of merely a car. The garage man and service man can get a result to his own advantage by appealing to the same spirit in the customer. Since most people do want to talk about parts for cars and since Ford dealers and others are going to emphasize parts much more in their maintenance work on Fords, the men in such institutions will find it profitable to display parts and accessories well and thereby talk more intelligently about them to customers.

The illustration at the head of this article shows accessory counters especially well located to give them good display to service and garage customers and to patrons who are waiting for some of the smaller and quick service jobs. No one can enter the building without passing these displays and there is no doubt but that they are a lucrative source of revenue. The show cases, incidently, are so arranged that the glass partitions above them may be closed and locked when desired.

Display Counter and Sales

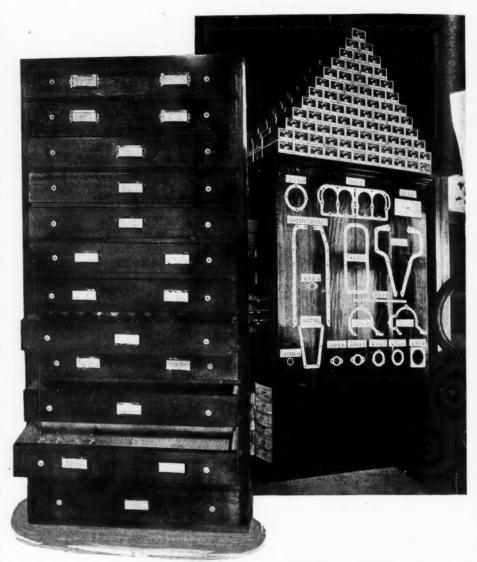
The display counter has a great deal to do with the sale of accessories and parts. The counter, for example, in the illustration on page 19 has much to recommend it. Although the place of business in this particular case is not a Ford establishment nor does Ford work, it is well adapted to concerns doing such work.

The case is a steel and glass construction, the slender uprights not hiding even so small an item as a spark plug. The case is in harmony with the shelving and other fittings. The top of the counter is covered with linoleum and the edges are bound with polished brass moulding. Such a top is well adapted to handle metal articles, as it cannot crack, dent and splinter. It is noiseless as compared to glass and roll holders for wrapping paper and other fixtures of this sort may readily be bolted to it.

It will also be noted in this particular illustration that there is a price card rack on the counter. This is an excellent plan because it enables the salesman to instantly refer to any item that may be called for. It saves placing price tags on each bit or shelf, which tags sometimes are torn off or damaged in service and naturally cause inconvenience.

Cafeteria Display Sells

Cafeterias probably sell the greater share of their foods because inviting looking dishes are set out to be gazed upon by patrons. The chances are that many a person who enters a cafeteria does so with the idea of buying just so much food. He generally gets more than he anticipated because he sees dishes which tempt him to buy. The same holds true of the man or woman who comes into the motor car establishment. What the eye seeş it either wants or does not want; it all depends upon the display.



The cabinet at the left contains gaskets, but no one would know it. Far better to have them out on display, as shown at the right. A customer or mechanic then can point to the particular one he wants.

Table Showing the Value of Stock Carried by Various Types of Dealers and Garages

Ford Dealers	A 22 05 4 550 00
Stock-\$4,385.25x5029	\$ 22,054,779.08
Turnover five times annually	110,273,895.40
Other Dealers	
Stock-\$866.94x8209	7,116,710.46
Turnover five times annually	35,583,552.30
Garages, Repair Shops and Supply Stores	
Stock-\$2.613.15x31.000	81,006,650.00
Turnover five times annually	405,033,250.00
Total Sales	
Ford dealers	\$110,273,895.40
Non-Ford dealers	35,583,552.30
Independent garages, repair shops and supply stores	405,033,250.00
Total business done by Ford dealers, 21 per cent.	\$550,890,197.70

Table Showing the Approximate Volume of Business Done in a Year by Various Dealers

	Up to \$1,000	\$1,000-\$3,500	\$3,500 and Over
Ford Dealers (128)	21	52	55
	17%	40%	43%
Other Dealers (179)	48	73	58
	32%	41%	27%
Supply Dealers (143)		55	36
	37%	38%	25%

924

And in this connection a word may be said about showing off accessories and parts to advantage.

The same factors or neatness, cleanliness and so on that apply to the merchandising of any article apply to automobile parts and accessories. But there is in addition to these another factor which must not be overlooked and that is the factor of making the parts visible. One of the illustrations in this article, for example, refers to the subject of gaskets. In one instance the gaskets are kept in drawers and when a customer comes in to buy one or more of these he has to stop to explain about the particular gasket or gaskets he is after.

A much better way is to have the gaskets visible to the customer, as shown, so that he can point to the particular ones he wants. It is only necessary, of course, to put up one of each gasket on the display board, as the complete stock of them may be carried in drawers or upon shelves. People are apt to call a gasket by any but its correct name, consequently if they can see the gasket displayed there is little possibility of a mistake being made.

When it comes to displaying accessories for Fords preference should naturally be given to those items which statistics have shown are the greatest sellers. We have already seen that the biggest sellers with Ford dealers are locking steering wheels, bumpers, speedometers and engine temperature indicators. Consequently Ford dealers will show these off to more advantage than the other accessories.

The same holds true of the service stations and garages, where times, spark plugs, lamp bulbs and transmission band lining seem to be the biggest selling items.

Care in Displaying

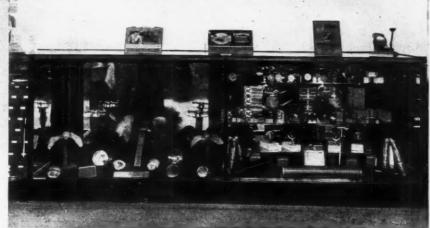
.00

Care should be taken not to make the showcases merely a place of storage for parts and accessories. Unless paper cartons are attractively decorated a show case is a miserable looking piece of equiment when stuck full of many such cartons along with other pieces of equipment. If there is a superfluous amount of stock it is better to keep it out of sight and place only a few of the articles in the show case.

Authorities differ as to whether a showcase should have only a few pieces on display or be quite liberally filled up. Both are right. Many window displays, for example, become very attractive because of their utter simplicity. There may be a single item displayed, but this item is enhanced by the surroundings, so that the whole looks attractive and such a window in dollars and cents probably is as effective as one filled with many items.

But, a window filled with a lot of neatly displayed nickeled plated parts and accessories for Fords, robes, trunks, and so on always will attract attention because people like to see what's on the market to doll up the car. We have only to witness the crowds which gather around a window wherein there are dis-





This illustration speaks for itself. It is a good example of what to do and what not to do. It is all right to get plenty of "stuff" into a showcase, but it must be arranged orderly.



Very often it is not possible to have all the stock in sight, nor is this always desirable. To that end a small showcase will suffice.

played a multitude of radio parts and fitments. A single radio cabinet with ranging a showcase or window with a the finest outfit in the world in it if great variety of objects is to arrange all shown alone in a window will not attract these objects carefully. There is no anywhere the crowd that such a window would if filled chuck full of condensers, must not look as though the top of the and one other items.

The chief thing to look out for in arobjection to a lot of stuff, but the stuff ear phones, terminals, and a thousand case had been opened and everything dumped in with a scoop shovel,

Marc

Tra

bers

rest

mot

Coa

the

of t tion

coo

sar

and

con

lun

the

wh

ent

of ab

sai

ass

pr

mi

in

th

B

B

ci

te

aı

ir

ir

This is the third of a number of articles on Ford service, others of which will appear in forthcoming issues of Motor Age. The first article on "The Field of Ford Service" appeared in the Feb. 28 issue, the second article, "Parts Replacement Simplifies Ford Service" appeared in the March 13 issue. Other articles in the Ford series to be printed soon are on the following subjects:

Specialized Service Work for Fords. Servicing the Ford Powerplant. Servicing the Ford Chassis.

Flat Rates for Fords (three articles).

The Well Equipped Ford Shop. The next article will appear next week.

Seasonable accessories should be given prominence. There is a logical time to display heaters and camping outfits. On a rainy day the stores, especially in the larger cities, are quick to hang out a sign, "Umbrellas, \$1.50." They push the stock at a logical time. Very often when we drive along on a rainy day with the road slippery and the going pretty hard in general we think of chains. We may pass a garage or service station and think nothing about the slippery going. But if we pass one which is making a feature display of chains, the chances are ten to one we might stop and buy a set. It is a subtle way of "Asking 'Em to Buy."

In most cases it is best to sell an accessory at a price which also takes Tabulation Showing the Relative Line-Up in Importance of the Sales of Accessories for Fords as Reported by Three Different Classes of Dealers

Ford Dealers	Other Dealers	Supply Dealers
Lock, Steering Wheels23	Timers31	Timers35
Bumpers21	Plugs13	Plugs22
Speedometers19	Bulbs	Transmission Lining12
Motormeters14	Transmission Lining13	Bulbs
Tires	Tires	Fan Belts 10
Shock Absorbers10	Fan Belts10	Tires
Radiator Caps 9	Motormeters 8	Dash Lights 8
Chains 7	Chains 6	Motormeters 7
Plugs 6	Shock Absorbers 4	Spotlights 7
Dash Lights 6	Radiator Caps 4	Shock Absorbers 5
	Tubes 4	Anti-Rattlers 5
Lamps 6 Timers 6	Fender Braces 4	Bumpers 4
Foot Accelerators 8	Lock. Steering Wheels 3	Cutouts 4
	Bumpers 3	Batteries 4
Bulbs 4	Cutouts 3	Coil Points 4
Transmission Lining 4		Lock. Steering Wheels. 3
Cutouts 4	Spotlights	
Tubes 3	Coil Points 3	Radiator Caps 3
Pumps 3		Fender Braces 3
Heaters 3	Headlight Bulbs 3	Foot Accelerators10
Fender Brackets 3	Windshield Cleaners 2	Heaters 2
Fan Belts 3	Foot Accelerators 2	Horns 2
Horns 2	Dash Lights 1	Locks 2
Locks 2	Pumps 1	Windshield Cleaners 2
Spotlights 2	Heaters 1	Headlight Bulbs 1
Windshield Cleaners 2	Batteries 1	Stop Lights 1
Anti-Rattlers 2	Jacks 1	Pistons 1
Batteries 1	Springs 1	Ignition 1
Jacks 1	Stop Lights 1	Steering Braces 1
		Odometers 1
4		Speedometers 1
		Chains 1
		Pumps 1

care of the installation. In other words when you quote the customer a price of a bumper or steering wheel it should be "Price installed, \$7.50," or \$15 or whatever the price may be. This gives assurance that the item will be correctly

installed and, furthermore, provides work for the shop. In most cases the customer is not equipped to drill holes or do shop work and consequently he can be sold readily on having the work done in the dealer's shop or service station.

Salesman Averages More Than \$100,000 a Year for 14 Years

"Pick out a good line of cars, selly yourself on it and work hard," is the advice of Harry Steiner, salesman of the Kardell Motor Car Co., Reg distributor in St. Louis, to salesmen or prospective salesmen who would attach the full measure of success in the automotive field.

Steiner has been with the Kardell Co. for 14 years and during that time his sales have averaged over \$100,000 a year.

"It takes several years to establish a trade in every line of business as well as the automobile," says Mr. Steiner "and my motto is 'sell a buyer of an automobile and keep him sold.' By that I mean to sell him good service, and when you sell a good line of automobiles you do not have to give anything. It is very easy to renew a customer's business after you have sold him properly once and he is in the market again.

"I have renewed sale after sale in the past 14 years, selling my customers as many as nine new machines, while the majority of my customers are driving their third or fourth car. And I get most of my prospects through my customers. In fact, my business now is averaging about 75 per cent through my

customers and their friends. You cannot do too much to try to satisfy a customer, or to help him out in some way. In cases where I have shown a client my willingness to do these things, I have never failed to be rewarded with an order from him or some of his friends.'

Although Mr. Steiner started with the Kardell Co. 14 years ago as a salesman and while he still occupies that position nominally, in reality he conducts his own affairs through the company office much after the fashion of a sub-dealer. He buys his cars from the company, makes his own trades, etc.

"When I trade a Reo car," said Mr. Steiner in speaking of the used car bugaboo of the automobile dealer "I have it put through the shop where all in the handling of used cars.'

necessary repairs are made. I have it repainted, renickeled, new top if necessary, new linoleum on the running board if needed, and sell the car with the same guarantee as a new car. A car of this kind brings a very nice price, with additional profit, because it looks very good and usually gives surprising service. It is surprising the few come-backs I have. But in case a car does not give satisfaction, I do not hesitate for a moment to make it good, because I have made many a sale of a new car through selling a man a used one.

"Most salesmen do not understand the value of a used car and oftentimes a good buyer will outsell a salesman on his old car, and therein lies the difficulty

What Can the Automotive Dealer Do With Radio?

THE rapid growth of radio has swelled the profits of many automotive dealers who have found that selling radio merchandise fits in well with their organizations. The automotive dealer who sells transportation also is selling a means of communication. When he sells radio equipment, he merely sells another means of communication. Motor vehicles and radio, transportation and communication are doing more than anything else to bring human beings in touch with each other and the outside world.

An article next week on

MERCHANDISING RADIO By A. H. PACKER.

1924

an

ne

d-

ry

he

An Idea Put Los Angeles Association Ahead

Leaders in Trade Organization Formed Committee of 30 and Put Over Successful Membership Campaign and Service Program

O-GETTER tactics have been employed with remarkable success by the Los Angeles Automobile Trade Association in boosting the membership of that organization, with the result that it is now the largest automotive trade association on the Pacific Coast, and has a substantial balance in the treasury. In November, 1922, some of the more active spirits in the association became impressed with a realization that the organization was "slipping"; that there was not present the degree of cooperation among the members necessary to insure successful administration and that the membership list could stand considerable swelling.

J. S. Bushey, one of the present directors, conceived the "Committee of 30" Invitations to be present at a luncheon to be given for the "good of the association" were sent to 30 members who were workers and who had consistently endeavored to promote the welfare Nothing further of the association. about the purpose of the luncheon was said in the invitations: but when the 30 assembled it was explained that the plan provided for each member of the committee personally going out and bringing in new members. Each committeeman was required to bring at least one before the next meeting, and those who failed were to buy a turkey dinner for those who made good.

Permanent Committee

This resulted in effecting a permanent organization of the committee. J. S. Bushey was made chairman and P. W. Battelle, secretary-manager of the association, became secretary of the committee. At the next luncheon it was announced that 22 additional members had been obtained.

After a series of meetings a detailed report of the results was read, and it was disclosed that 98 new members had come into the fold and the treasury enriched by the addition of \$2,450 obtained from initiation fees. The association now has about 160 per cent more members than in November, 1922. The plan is still in operation and has been copied successfully by other organizations on the Pacific Coast.

The association maintains collection, legal, credit and legislative departments, and through the activities of the latter has been able to curb much inimical legislation. At the last session of the legislature there were no laws passed which seriously affected the automotive industry in California.

The collection service operates somewhat differently than the ordinary plans. A corps of 14 men cover all parts of the city daily, and surrounding towns several times a week, collecting accounts, re-









At the left is George Belles, treasurer of the Los Angeles Automobile Trade Assn. Top center is Wesley D. Smith, president; bottom center, J. W. West, vice-president, and at the right is Walter W. Biddick, vice-president

gardless of the amounts, on a basis, to members of \$1 per account per month. By this method accounts receivable are kept in good shape at little expense, and in addition debtors are treated courteously and retained as customers.

In "selling" the association, emphasis is laid particularly upon its ability to render service to its members, and upon the necessity for cooperative effort if one is to succeed in the automobile business.

"During the year many firms have dropped by the wayside," reads the latest bulletin from the secretary's office. "The reasons for this are many. Some were under-capitalized; some poorly managed; certain firms thought the public were simple and easy-marks, now they know better; many had improper accounting systems; others gave credit too freely; some believed they could exist without the cooperation of their fellow-men—this type were among the first to show up missing."

Officers of the association are as follows: Wesley D. Smith, president, manager Keaton Tire & Rubber Company's southern California branch; vice presidents, Walter W. Biddick of Walter W. Biddick, Inc., and J. W. West, J. W. West Co.; secretary-manager, P. W. Battelle; treasurer, George Bellis, manager Lee Tire & Rubber Co. branch.

A Service for Protection of Car Owners and Dealers

I N order that owners of automotive vehicles might have assurance that they are getting full value for their money when it comes to buying fuel at filling stations, the Public Protective League, 20 East Jackson Blvd., Chicago, through its division of weights and measures, has seen fit to sell to each filling station a plan of mutual benefit to car owners and filling stations.

Under the plan the filling station or garage agrees to inspect the pumps for measurements at least once a week, fill out the inspection forms furnished and to mail these to the general offices of the league at the end of every fourth week. The station gets the official emblem of the league and displays it in a conspicuous place. The league also furnishes the station with advertising matter to be distributed among customers.

The inspectors of the league have full right to inspect the pumps at any time. The service is leased to the filling station and at the end of the year the customer either renews the contract or returns to the league all the property. The cost of the service is \$10 with the application and a balance of \$15 to be paid upon receipt of the emblem.

The advertising matter sent out by the league stresses the point that the dealer or filling station which has put in the service has spent money for the protection of customers and is, therefore, worthy of patronage.

Mar

the whe that of t

read

spir

700

stat

not

car

Wh

fro

mo

fro

haj

tim

cor

sai

act

po

ho

Jo

ra

ve

Engineering for the Service Man

No. 11

Figuring the Load on the Front Wheel Bearings Is Simple—But, the Jolts and Jars and Shocks Cause More Strain Than the Straight Weight of the Car

AY tank ay bane purty goot carpenter some day," said the Big Swede, as he carefully put the last tool in its place, at the end of the day's work. "Ay got purty near all kinda tools, all but da one da sooper-tendent taak aboot da udder day. He say he need factor for safety to put up hees buildin' and dot make der buildin' sthrong. Ay tank ay buy one of dem factors mit safety so ay be best carpenter vat effer iss."

Perhaps the Big Swede was right in figuring that the factor of Safety would enable him to good work if he used it right, but he was quite wrong if he thought it was a tool of some sort that he could buy at the hardware store and keep in his tool box. The factor of safety is a mighty tool, but a mental one, a thing of mathematics, the allowance that is made for those forces, the amount of which we can not exactly determine.

So it is that in building the frame of a motor car we can figure how strong the frame should be to hold up the engine, body and passengers, but who can figure exactly the strain that it must stand when the car hits a bump or rounds a curve?

For this reason in figuring the strength of any material, whether it be two by fours for a house or steel balls for the bearings of a car, the strength of the material is known, approximately, and the load it is to carry is known—again approximately. Then to make sure, we make the size of the part such that its strength is from 4 to 10 times what we figure the breaking strain to be. That takes care of some of those "approximatelies" that seem to creep into our best figures, and we call the 4 or the 10 the factor of safety.

The question may come up in connection with a change from wood to disc wheels, as to whether the strain on the bearings will be greater with the new wheels, for in most cases the design is such that the center of the tire is brought more nearly under the point at which a projection of the king pin would strike the road. This is done to make steering easier, but at the same time it is true that it increases the load on the inner bearing and may decrease or change the nature of the load on the outer bearing.

These changes in load, however, refer merely to the standing load, but when the car is in motion, is hitting the bumps and rounding the curves, there are many shocks and side strains which put more load on the bearings than the weight of the car would do. For this reason it does not mean that a bearing will be appreciably affected by a slight shifting in the weight distribution, because it has to be made so strong to withstand the shocks that can not be figured.

A consideration of the standing or static loads is of interest, however, for it gives us an insight into some mechanical prin-

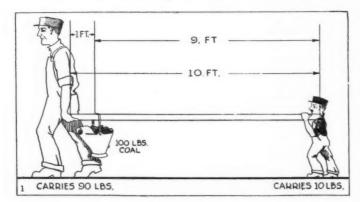


Fig. 1—The man farthest from the load carries but a small

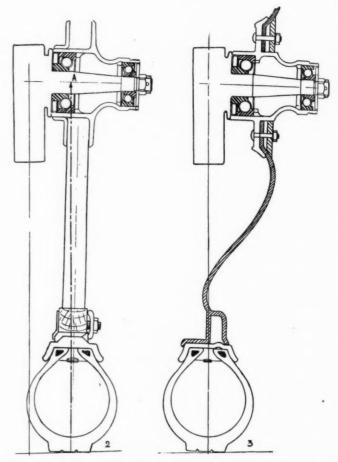


Fig. 2 (left)—The load with the wood wheel comes between the two bearings but is nearest to the large bearing. Fig. 3 (right)—With a disc wheel the tire may be more nearly under the king pin so that the load distribution between the bearings has changed somewhat

ciples which we can also apply to other problems on cars and around the shop.

A simple illustration of load division is shown in Fig. 1 where two men are shown carrying a pole on which a load is supported. We of course know that with the load placed so near to the end the big fellow is holding, that he will carry most of it. Besides the general conception that this is so, however, we also have definite rules for figuring exactly how many pounds he is called upon to carry.

In a case of this kind there are two fundamental facts to be remembered. One is that if the load is supported in the air, that the total lifting forces must equal the total force downward produced by the load. Then if the weight is 100 pounds as shown, the total lift must also be 100 pounds. The other rule is that the man farthest from the load carries less of it, and that the force he exerts multiplied by the distance to the load must equal the force that the other fellow exerts multiplied by the distance he is from the load.

Perhaps we can see the answer. It is a 90-pound lift for the big man and a 10-pound lift for the small one, for the distances are 1 foot and 9 feet, respectively. Now to check this answer with our two rules we find that the upward forces of 10 pounds and 90 pounds add up to equal the downward force of 100 pounds, while the lifting force of 10 pounds times 9 feet equals the force of 90 pounds times 1 foot.

24

The action of the two men with the weight between them on the pole illustrates the load distribution that we have in Fig. 2 where a wood wheel is used. In this case we will assume that the weight of the car is 2800 pounds and that one-fourth of the weight is on each wheel so that the total load on each wheel is 700 pounds. We will further assume that the point on the ground where the wheel rests is such that the line of reaction from the ground crosses the center line of the steering spindle at "A". We will also say that the distance from "A" to the small bearing is thirteen times the distance from "A" to the large bearing.

Then as in the case of the two men, the large bearing being closer to the load will carry most of it. We can also see without much figuring that the large bearing will carry 650 pounds, while the small one carries 50 pounds.

The upward forces of 650 pounds and 50 pounds add up to 700 pounds, which is the load the wheel must carry, while it is also true that the 50-pound force acting through 13 times the distance from the point "A" will serve to balance the action of the 650-pound force. Remember, however, that these are static figures, depending on the weight of the car when it is not moving, and that they may be entirely changed when the car rounds a curve or hits a bump.

What the Disc Wheel Does

In Fig. 3 we have a distribution of the load carried by the front wheel which is different due to the use of the disc wheel. This wheel is so constructed as to throw the center of the tire more toward the center of the car, and now the line of reaction from the road does not fall between the bearings but is inside of the large one.

To illustrate this condition we will consider what would happen if the two men carrying the load on the pole should be using an 11-foot pole and should put the load at one end of the pole as shown in Fig. 4. We again know that the forces times the respective distances must be equal about any point considered as a center. Then for a moment we will figure that the place where the big fellow is holding the pole is the pivot. The load has an action around this pivot point equal to 100 pounds times 1 foot, and to balance this the little man must PUSH DOWN with a force of 10 pounds, which has an acting radius of 10 feet, and accordingly has the same effect as the load.

The large fellow, however, now has to carry more than the actual load for he must pull upward with a force equal to the two downward forces of 100 pounds from the load and 10 pounds from the small fellow.

In the same way the large bearing in the disc wheel hub of Fig. 3 must carry a load greater than it carried before while the load on the small bearing may be just about the

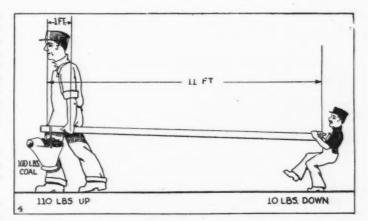


Fig. 4—With the load at the end of the pole the distribution of weight illustrates the conditions of Fig. 3

same but in the reverse direction. These general points, however, are based on the standing load, so that the relatively small increase in load does not at all mean that anything in particular has happened to the safety of the wheel or bearings. What Happens in Skidding Into the Curb

On winter days with icy streets it is not uncommon to see a car with a wheel broken due to skidding into the curb. The sideways strength of the wheel is less than its strength in supporting its load, but even so a considerable force has to be applied to break off the spokes, and this force not only puts a strain on the wheel, but on the bearings as well. Such strains are present every time the car rounds a curve, even when they are not great enough to cause breakage of any kind, and it may be interesting to see what a 500-pound force for example would do in putting a load on the bearings.

In Fig. 2 we will say that the car has skidded into the curb so as to apply a 500-pound force at the center of the side portion of the tire, which is 15 inches from the center of the wheel. We will consider that the distance between the bearings is 3 inches, and that the force tries to rotate the wheel around the large bearing. The small one will then have to resist this tendency.

Its radius of action, however, is only one-fifth of that of the force at the tire so that the strain on this bearing will be five times 500 or 2500 pounds, due to the force of the impact against the curb.

This may be an exaggerated case, for the standing load on the large bearing was only figured as 650 pounds. It shows, however, how the unusual loads exceed the loads on which we have definite figures.

"Do You Object to Used House?" Asks Dealer

"Do you object to living in a used house?" is the question asked by the Jonas Cadillac Co., Milwaukee, in a rather unusual used car department advertisement in newspapers. The text says in part: "How many people are living in homes in which some other family has lived before—in other words, used homes How many people are getting profit, happiness and health out of automobiles which somebody else owned before they did?

"Where would this country be today if every time a man moved out of a house he built it would be destroyed? Where would the country be today if all used cars were junked without having lived their full life of usefulness?

ie

1

k

d

"What of the men, who, for good and sufficient reasons, don't want to buy new cars? What of their families? What of their business, health and happiness? "Used cars, like used houses, are filling a most vital need in this country. Where the one shelters the family as one under its roof, the other takes the family as one out into unexplored byways and reveals to them new delight. Where one is a common meeting place for the whole

family, the other is a source of inspiration and joy to the whole family. Each plays its part.

"There is no more reason for hesitating about buying a good used car from a reputable dealer than for hesitating about moving into a used home."

23 Years Ago This Week In Motor Age

(From Motor Age of March 30, 1901.)
Review of the Chicago Show

The show opened last Friday night. The occasion was not the formal opening to the public but was a private inspection of the exhibits, twenty thousand invitations having been sent by the management to the best families in Chicago.

* * The evening was a gratifying success and accomplished a two-fold object. It attracted to the exhibition a large number of Chicago's most prominent people and thus made the patronage

of the show, a class comprised of immediate or subsequent buyers of automobiles.

Advertising in the March 30, 1901, Issue
Bevin Bros., East Hampton, Conn.,
occupied half a page advertising their
motor bell which was put into the floor
of the car and used as a warning signal.
In large type across the top of their ad,
they say, "These are said to be the best
bells made." To-day, they would probably insist that they were the best bells
ever made.

MOTOR AGE'S PICTURE PAGES



This model of the Hudson River vehicular tunnel was made by the Westinghouse Lamp Co. to determine the most efficient lighting system



"Look out, front wheel brakes!" warns this Paris taxi, equipped with four wheel brakes





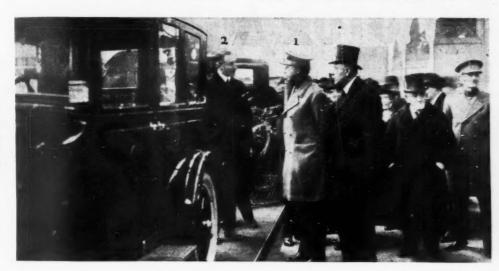
How would you like to try to make this with a little of the pre-war fluid? City architects of San Francisco had to do it to reduce a 30 per cent grade to 17 per cent

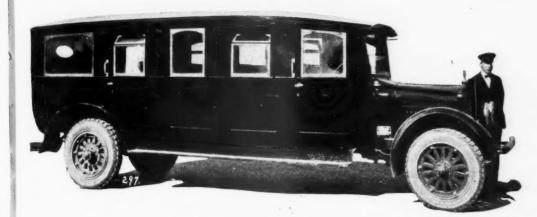
OF AUTOMOTIVE INTEREST

12 m 18

King Albert of Belgium visits the show at Brussels. The king (1) is questioning E. Tordeur (2), manager of the Studebaker exhibit. Which suggests another used car solution: Why not do with the used cars what they do with used kings?







22 mg 25

This Stewart truck, 28-passenger type, is used in Stockholm, Sweden, which city, it is said, is rapidly becoming a good truck market





"A bear for service"-slogan of the Oakland company was demonstrated to those who doubt by this unique stunt

Vol. XLV

Thursday, March 27, 1924

No. 13

Julian Chase, Directing Editor Sam Shelton, Managing Editor B. M. Ikert, Technical Editor A. H. Packer

Tom Wilder

P. L. Dumas J. E. Schipper, Field Editor

W. L. Carver, Field Editor

C. G. Sinsabaugh, News Editor Warren Baker, Ass't News Editor D. M. McDonald, Detroit News

D. M. McDonau,

Home Office, 5 South Wabash Avenue, Chicago

Motage, Chicago

Randolph, 6960 Cable Address

BRANCH OFFICES

New York City—U. P. C. Bldg., 239 West 39th St., Phone Pennsylvania 0080 Detroit—7338 Woodward Avenue, Phone Empire 4890 Cleveland—538-540 Guardian Bldg., Phone Main 6432 Philadelphia—56th & Chestnut Sts., Phone Sherwood 1424. Indianapolis—1212 Merchants Bank Bldg., Phone Circle 8426

Su	bsei	int	ion	Ra	tes

	3.00	per	year
			year
			year
Single Copies		35	cents
Subscriptions accepted only from the Automotive	e Tr	ade	

Entered as second-class matter September 19, 1899, at the post-office at Chicago, Ill., under the Act of March 3, 1879.

Copyright 1924 by The Class Journal Co.

Member of the Audit Bureau of Circulations Member, Associated Business Papers, Inc.

THE CLASS JOURNAL COMPANY

Mallers Building, 5 South Wabash Avenue, Chicago
Horace M. Swetland, President
C. A. Musselman, Vice-President
and General Manager
E. M. Corey, Treasurer
Harry Tipper, Secretary

W. I. Ralph, Vice-President
E. E. Haight, Western Manager

Owned by United Publishers Corporation, 239 West 39th St., New York; I. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.

Public Business Is Your Business

THE Post Office Department has before it the prayer of some 300,000 employes for higher salaries. The clerks, carriers and others engaged in the collection, transmission and distribution of mail matter believe they are underpaid and no doubt many of them are. It is especially true that in view of the abnormal increase in the costs of living in large cities salaries established on the standards of the country as a whole are likely to be inequitable for some metropolitan centers. The Postmaster General recognizes this and so states in a letter to Chairman Griest of the Committee on Post Office and Post Roads of the House.

Several bills have been introduced in Congress for the relief of postal employes. The Postmaster General states that the increases provided in the most representative of these bills would cost the department \$150,000,000 a year. He foresees a deficit of \$30,000,000 in the revenues of the Department this year. The added cost would make a deficit of \$180,000,000, which would have to be made up out of the treasury. The Postmaster General does not deny that adjustments should be made in the compensa-

tion of employes, but he believes it should not be done hastily or spasmodically, but only after a thorough study of the whole situation. In this connection he states that a complete study of the costs of the various branches of the postal service is now being analyzed and that the results are expected to be available in a few months. He would like to have action deferred until after that time. He is undoubtedly right.

Meanwhile every business man, every automotive dealer, should take an interest in this subject. It is his own business. Any increase in the cost of the postal service must be paid by him whether in higher postage rates or general taxation to make up a deficit. It is a matter that the business man cannot afford to neglect. He should take it up with his Congressman and Senators and let them know that although he favors adequate compensation of postal employes, both as a matter of justice and in order to assure the continued efficiency of the service, he believes it should come after a most careful study of the situation has been made so that it will be equitable and comprehensive.

More Price Increases

AST week's Motor Age recorded some more price increases. All models in two well known lines were advanced by margins of from \$10 to \$100. The manufacturers report rising costs of production and narrow margins of profit. They are attempting to protect themselves. At the same time we have one large producer reducing prices on two models, \$40 on one and \$100 on another.

It goes to show that there are some differences of opinion-or conditions. One fact is outstanding-automobile values at prices which have prevailed for the last few months have never before been equaled. But that is not saying they would be excelled at a later day when we get further along with the progress of automotive engineering.

Two Jobs Lost

7 HAT is your charge for washing?" a customer asked of a garage attendant the other day. The price was quoted. "And how much for greasing?" was next asked. The attendant replied that he didn't know and he made no effort to find out. And so the two jobs were done in a garage up the street where a price for any job is ready for quotation.

Are You Ready?

"I HAVE put on four extra salesmen," says a Chicago dealer who last year was very successful with new car sales. "I sold a great number of cars in 1923 and I know that there is going to be a lot of money in servicing those cars this spring. I have bought some new equipment and these men are making calls on every owner, soliciting their spring repair business. I am not only ready to meet any demands made upon me. but I intend to see that I get the business."

924

ıdy

hat of

re-

He

ne.

ler,

ısi-

ust

ral

ısi-

it

OW

stal

as-

s it

tu-

m-

ice

nes

ion

ro-

rge

and

of

to-

ast

t is

nen

ive

ner

lav.

hat

Ind

ere

hi-

rith

in

ney

me

on

1

me.

A Business That Will Not Slump

ODAY at the height of business prosperity in America we are confronted on all sides with the query, "Will it last?" Some ask, "How long will it last?" with an air of definite assurance that the end is in sight and others condescendingly give us three or four months more before the ringing down of the curtain.

These questions and these predictions are most often spoken in connection with the automotive industry, for it is the outstanding leader of the present business progress. The industry confounded the statisticians and prophets last year by its remarkable record and there are few who will venture a definite prediction for better or worse this year.

Automotive transportation, however, is a business about which there should not be any doubt. It is a business that is here to stay and it can safely be stated that it will continue to grow. General business conditions might suffer a relapse and new car sales might fall off. Manufacturers might find the outlet for their vehicles suddenly restricted by the contraction of credits and of course distributors and dealers would be the first to feel such restriction and they in turn would pass the intelligence on to the factories. Not that there are now any signs of such condition coming to pass. The statement is merely made for the sake of what follows.

There is a constantly growing use of the motor vehicles in the hands of owners. This use of motor vehicles constitutes the business of automotive transportation. Automotive transportation has a wide field. It delivers groceries, furniture and drygoods from retailer to consumer; it hauls freight from the railway depot to warehouse and from warehouse to the retail store; it delivers milk and laundry; it carries the salesman over his route; it takes the family to church and theater; it brings St. Louis and Chicago only 12 hours apart by highway; it hauls farm produce to market; it carries liberty loving tourists from coast to coast; it is the last commodity that red-blooded Americans would be willing to give up

Automotive transportation is a commodity. Motor vehicles today are expected to and do deliver mileage. In a dealer's service station the other day a car that had gone from that dealer's store into the hands of a buyer only 40 days earlier was brought in for adjustments. It had traveled 3,000 miles. At the same time there were in the service station two cars of the same

make which were manufactured in 1922, one of which had gone 26,000 miles and the other 22,000. They required repairs, but there was lots of mileage left in them. This shows the extent to which motor cars are being used.

Automotive transportation as a business is not altogether dependent upon the sale of new cars, but it does depend upon the maintenance of those cars already in service. Of course a certain proportion of cars will pass the stage of profitable repair each year and will be junked, but with improvement in quality of vehicles, in the knowledge of economical operation and in methods of maintenance the modern motor vehicle shows surprising longevity.

In case of business depression of such magnitude as to affect the sale of new motor vehicles it most likely would be found that owners would be much more inclined to have old vehicles reconditioned. For a smaller capital outlay than would be required to buy a new vehicle they could continue to enjoy the use of automotive transportation. Many businesses probably would find that by judicious use of automotive transportation they would materially reduce their expenses of operation.

Come what may, boom times or dull, it is apparent that an era of more intensive automotive transportation is upon us. Improved roads and more of them are a factor in this. The cars that are out will be used if the owners can figure out any way to use them.

One thing that will increase the use of them is the realization of the slogan "To reduce the cost and improve the quality of service," adopted by the National Automobile Chamber of Commerce and associated organizations for the maintenance equipment show to be held in Detroit in May.

Dealers who are selling automotive transportation rather than just selling automobiles need not worry about business. If they conduct real transportation stores they will have plenty of business. They will experience a wonderful demand this year for automotive maintenance and supplies, whether they sell any new cars or not. If they do business on an honest and fair basis they will have plenty to keep them busy all this year and next. With a well equipped shop and an adequate stock of supplies the progressive proprietor of a transportation store can count himself practically independent of temporary ups and downs in the new car sales volume. He is engaged in a business that will not slump.

1924 Makes Bid for Good Sales Record

Automotive Industry All Set For Heavy Buying Movement

Attendance at Shows and Other Evidence Indicate Exceptional Interest on Part of Public

NEW YORK, March 24.—The automotive industry is well set for the heavy buying movement anticipated at this season of the year, the beginning of the movement depending largely upon weather conditions. There is no indication now that automobile buying this year will fall below that of last. On the contrary, all signs point to an increased sales volume as soon as the movement gets under way. Attendance at shows has been unusually good and other evidence has been given of a well sustained interest on the part of the public.

Car producers, now operating on high programs, probably will not increase present schedules until spring buying starts in earnest and they are able to gauge accurately the extent to which output can be absorbed. The possibility that March production totals may not measure up to those of previous months witnesses the conservative policies to which car makers have committed themselves and the general desire to let actual sales conditions govern factory operations.

On High Programs

For the last twelve months the industry as a whole has been operating on high programs. The large schedules of recent months have been adopted not only to meet current demands, which has been above normal, but to guard against a shortage when the market reached its highest point of activity this spring. Producers have endeavored to prevent repetition of the condition of a year ago when there were not enough cars to go around during the season when prospective buyers flooded the market.

In no month of the last twelve has production fallen below the 300,000 mark. Output in January of this year was nearly as good as that in July and September of 1923, and February ranked with some of the best production months of last year.

Bus Demand Strong

A wholesome tone continues to be given to truck operations. Plants are actively engaged in turning out chassis and bodies for motor trucks as well as for motor buses and rail cars. The demand for buses is strong, coming from rural and industrial centers. Farmer demand for trucks has shown some slight improvement but will not reach definite proportions until spring buying starts.

There is every reason to believe that the farm market will absorb a much larger part of the output than it did last

year, though not reaching the point that under better agricultural conditions would be possible.

Parts makers have enjoyed an excellent season and are reporting operations at a good mark.

Utilitor Business Now Under Chicago Concern's Control

INDIANAPOLIS, March 22.-The tractor manufacturing and utilitor assets of the Midwest Engine Corporation (successor of the Midwest Eng. Co.,) were sold last week preceding the placing of this much troubled concern under a receiver. The Automotive Utilities Corporation, of Chicago, bought the Utilitor assets and right and will conduct the business here as a subsidiary of the Chicago corporation under the name of The Utilitor Com-Two one story buildings in the Midwest enclosure, which have housed various departments of the Utilitor division of the old concern, have been leased and in these new Utilitor business will be conducted. Wallace Bear who has been in charge of the Utilitor division of the Midwest corporation since this reorganization took place has been retained by The Utilitor Company as general manager.

Mr. Bear says that during last year much Utilitor business was done, both domestic and foreign. The showing made by the small tractor division attracted the Automotive Utilities Corporation, and while no forced expansion will be attempted there is a possibility of its material development.

TAX BILL IN COMMITTEE

WASHINGTON, Mar. 18.—The 1925 revenue bill, containing the reduction of \$25,000,000 in the federal taxes on automobile parts and accessories, and trucks, which was to have been reported out of the Senate Finance Committee this week, will remain with that Committee for three or four more weeks, it was indicated today, by members of the Committee who are laboring with the tax experts of the Treasury to ascertain just what amount the bill will provide as passed by the House three weeks ago.

IN NEW TRACTOR HOME

MEMPHIS, Tenn., March 22.—The Halloran Tractor Co. now occupies its new home on Butler avenue. The building is 77 by 150 feet.

TO MAKE BALLOON TIRES

BIRMINGHAM, Ala., March 23.—The Birmingham Tire and Rubber Company will begin the manufacture of balloon tires as soon as necessary machinery is installed.

798,555 Cars and Trucks Was G. M. C. Production Last Year

1922 Record in Both Output and Profits Distanced in 1923 Says Report

NEW YORK, March 24.—Manufacture and sale of 798,555 cars and trucks in 1923 as compared with 456,763 the preceding year and profits from other of its units produce a net income for the General Motors Corporation of \$62,067,526 in 1923 against \$51,496,135 in 1922. Net sales totaled \$698,038,947 compared with \$463,706,733 in 1922.

The corporation's annual report sent to stockholders today shows a most satisfactory condition financially and otherwise. Commenting on it, Pierre S. DuPont, Chairman of the Board and A. P. Sloan, Jr., President, say the net income for the year 1923 available for dividends was \$62,067,526. There is included only such proportion for profits of the Fisher Body Corporation and the General Motors Acceptance Corporation as was received in the form of cash dividends. The corporations share in the undistributed earnings of these two subsidiaries was \$9,941,429 which if added to the above net income would represent a total of \$72,008,955.

"After paying regular quarterly dividends on the debenture and preferred stocks requiring \$6,887,371 for the year there remained for the common stock \$55,180,155 or \$2.67 a share. Four quarterly dividends of thirty cents per share each were paid on the common stock aggregating \$24,772,026 leaving a balance of \$30,408,129 which was carried to surplus. The undistributed proportion of the earnings of the Fisher Body Corporation and the General Motors Acceptance Corporation was equivalent to forty-eight cents per share on the common stock of the General Motors Corporation.

"The corporation is in excellent financial condition. Cash in banks at the close of the year was \$47,069,805; sight drafts \$13,283,707; inventories \$138,678,131; current liabilities amounted to \$79,150,705. Leaving an excess of current assets over current liabilities of \$140,750,582. This compares with \$126,476,237 as of Dec. 31, 1922, an increase of \$14,274,345."

STRENGTHEN FINANCIAL STATUS

DETROIT, March 24.—Refinancing of Continental Motors Corp., Detroit, details of which have been completed will find the company in strong financial position, and prepared to undertake a manufacturing program which will tax production facilities of its plants.

The company according to its present plans, will not undertake any further expansion of its present plants. These have been equipped for large volume and will permit of an output of upwards of 300,000 engines this year.

r

d

n

f

e

d

Tricks in All Trades and Salesmanship

BOSTON, Mar. 21.—Sales Manager E. H. McCarthy, of the Nash Motor Company, tells of a fine example of salesmanship that was brought to his attention while he was at the Minneapolis show. It seems the Nash dealers in St. Paul and Minneapolis made a wager on the outcome of the sales at the show. On the opening night one of the St. Paul salesmen sold a car to a man who worked in that city. Taking his home address he found the man lived in Minneapolis, and so the sale was to be credited to his rivals. The next morning the salesman sought out the buyer at his work, found he was a single man, and then sold him the idea that he was making a mistake living in Minneapolis. As a result the man agreed to move if the automobile salesman would find him a suitable lodging. This was done; the man moved his belongings in a Nash car to St. Paul and the sale that had been chalked up for Minneapolis was transferred back to the St. Paul team.

HEAR APPLEBY AND RICKENBACKER

CHICAGO, March 22.-Speakers at the second annual banquet of the Central Auto Finance Association Tuesday night at the Drake Hotel were Capt. Eddie V. Rickenbacker, vice-president of the Rickenbacker Motor Co., and James H. Appleby of the Percy Chamberlain Associates, Inc. Mr. Appleby explained the details of the Appleby Motomart system of handling used cars and Mr. Rickenbacker declared that his company is definitely in favor of the Appleby plan. Mr. Appleby gave reasons why commercial paper secured by used cars sold under the Appleby plan should be acceptable to the finance companies.

Capt. Rickenbacker had just completed a tour of the county from Pacific to Atlantic, having visited most of the Rickenbacker distributors, and he reported that prospects were excellent for the sale of cars for at least another six months. He found, however, that conditions in the east, except in the large industrial cities, were not as good as in the central and far west.

About 100 members and guests of the association attended the meeting, which was presided over by Walter E. Heller, president.

MOTOR FREIGHT ON SCHEDULE

MEMPHIS, Tenn.,—The Valley Transportation Co. of Memphis has begun hauling freight on regular schedules between Memphis and Cleveland, Miss., and Boyle, Miss. Three trucks and trailers are used in the initial effort.

Reduced Cost and Improved Service to Be High Spots of Discussion at Detroit's Double-Header

Hope National Automotive Service Convention and Automotive Maintenance Equipment Show Will Attract
Upward of 2500 Trade Representatives

NEW YORK, March 22.—Hoping to attract an attendance of at least 2500 automotive dealers and service station proprietors to the National Automotive Service Convention and the Automotive Maintenance Equipment Show, officials of the National Automobile Chamber of Commerce have started circularizing the trade with announcements of the two enterprises which will be held concurrently in Detroit May 19 to 23.

"To reduce the cost and improve the quality of service," is the official slogan of the two enterprises in which the N. A. C. C. has the co-operation of the Society of Automotive Engineers, Motor and Accessory Manufacturers' Association, National Automobile Dealers' Association, Automotive Equipment Association and Service Equipment Associates.

The announcements state that among those who will be welcome to the convention and show are factory service managers and engineers, distributors and dealers and their service managers, shop superintendents, proprietors and mechanical men from garages and independent repair shops, and electrical, tire and battery shops, as well as service managers for fleet owners.

The convention and show are distinctly for the trade and the general public not identified with the trade will not be admitted. Any one in the trade making written request to the National Automobile Chamber of Commerce, 366 Madison avenue, New York City, or to any of the co-operating associations will be accredited a delegate to the National Automotive Service convention.

Chicago Moves to Meet Rapid Growth of Bus Transportation

CHICAGO, March 22.—Recognizing the growing importance of the bus as a factor in transportation, Chicago's city authorities have begun a series of conferences, the object of which is to evolve a definite policy respecting the regulation of motor coaches. The first of these conferences revealed surprisingly even to some of the city officials what a large part bus transportation already plays in Chicago's urban and suburban traffic complex. It also furnished a glimpse of future extensions and additions that promise to greatly increase the already large bus facilities.

One of the city aldermen announced that he had been informed of a comprehensive bus program contemplated by the Chicago Surface Lines in connection with the operation of trolley cars. It is planned, he said, to connect street car lines with outlying districts with bus lines, thus meeting the private bus competition which carries much passenger traffic to steam railroad stations. The Surface Lines, it is reported, intend to give transfers from buses to street cars and from street cars to buses. In this manner the surface lines would reduce daily transportation costs in some instances from around 50 cents to 14 cents, on a basis of two trips. It is no novelty at all in Chicago to hear of the institution of new bus lines.

HIGHWAY BILL OFFERED

EDMONTON, ALTA., March 23.—A bill submitted to the legislature calls for the borrowing of \$3,500,000 for development of the main highways in Alberta.

COMPANY REORGANIZES

CLEVELAND, March 24.—The Bock Bearing Plant is to be reorganized under plans that were completed at a meeting of a number of well known Cleveland and Ohio business men. The plant, or at least the controlling interest, was owned by the Standard Parts Co., the \$20,000,000 auto accessory corporation, which is being liquidated.

Maynard H. Murch, was elected president, although Robert E. Clingan, vice-president and general manager will continue as the operating head of the company. C. O. Steinbicker was elected secretary and treasurer.

W. E. Bock, president of the Erie Glass Co., Toledo; W. S. Quinlan, president of the Chicago Nut Manufacturing Co.; W. G. Mather, president of the Cleveland Cliffs-Iron Co., of this city; F. F. Prentiss, vice-president of the Cleveland Twist Drill Co.; John A. Kling, vice-president of the Kelley Island Lime and Cement Co., of this city; George E. Randles, president of the Foote-Burt Co., Cleveland; and R. B. Wallace, of the Kinney Steamship Co., are prominent manufacturers and business men who have been added to the board of directors of the company.

R. E. Clingan, George E. Randles and W. S. Quinlan were appointed to the executive committee.

ADD TO EQUIPMENT

NIAGARA FALLS, Ont., March 22.— The Burgess Battery Co., manufacturers of dry batteries, etc., are installing additional equipment in their plant here to enable them to increase service in Eastern Canada and extend their business in Mexico and New Zealand.

Automotive Supply Business in W. Canada Is Going Strong

Conditions Better Just Now Than in Any Like Period of Previous Years

CHICAGO, March 20.—The automotive supply business in British Columbia, Alberta, Saskatchewan, and western Canada generally is far better just now than in any corresponding period of a previous year, according to reports received by Commissioner William M. Webster, of the Automotive Equipment Association.

Mr. Webster's survey is based largely on observations made by Arthur R. Mogge, merchandising director of the association, who recently visited Vancouver, Calgary, Regina, Saskatoon, and other important points in the Canadian industry. Automotive jobbers in these various cities reported to Mr. Mogge that the wholesale business for January and February was much ahead of the same two months in 1923, one jobber announcing an increase of more than 200 per cent.

"Good business in western Canada," said Mr. Webster, "can be attributed directly to the mild winter and to the fact that the jobbers are doing a nice business in replacement parts and radio, as well as in accessories and garage equipment."

Mr. Mogge also toured the western part of the United States. The combined sales forces of Reynolds & Reynolds and Chanslor & Lyon Tacoma Branch met in Tacoma March 6, to hear an address by the association representative. A discussion which followed evidenced great interest in the possibilities for high tide development of the replacement parts business by A. E. A. jobbers. Long distance telephone messages from Tacoma carried the report of Mr. Mogge's address to Seattle, where a banner meeting of salesmen was held March 7 to hear him. This meeting was attended by representatives of Ballou & Wright and Reynolds & Reyonlds' Seattle branch. Mr. D. F. Hopkins, of Chanslor & Lyon, presided. Mr. Mogge illustrated his address with stereopticon slides. Plans were made later for comprehensive merchandising work in aWshington and adjacent territory in 1924.

DAVIS MOTOR CAR PRICES

CHICAGO, March 22.—The George W. Davis Motor Car Company, Richmond, Ind. announced that the following price schedule affecting all models would go into effect on and after April 1, 1924:

Davis	71	5-Pass.	Phaeton	1,395
Davis	72	4-Pass.	Legionaire	1,495
Davis	73	3-Pass.	Man O'War	
Roadster				1,395
Davis	74	5-Pass.	Sedan	1,895
Davis	78	5-Pass.	Berline Sedan	1,995
Davis	79	5-Pass.	Utility Brougham	1,595
Davis	81	5-Pass.	Mountaineer	
Phaeton				
Davis	83	3-pass.	Mountaineer	
Roadster				1,695
Davis	84	5-Pass.	Mountaineer Sedan	2,195
Davis	88	5-Pass.	Mountaineer	
Rerl	ine	Sedan		2 205

A Section of the Show at Boston



FILM BOOSTS GOOD ROADS

WASHINGTON, Mar. 17.—The value of improved highways is depicted in a road film just completed by the National Automobile Chamber of Commerce in conjunction with the U. S. Bureau of Public Roads, and is now available for release, free of rental, other than cost of transportation.

The film is entitled "The Road to Happiness," and was financed by the Ford Motor Company, and made under the direction of the N. A. C. C., representing the entire motor vehicle industry; the Highway Education Board, and the Department of Agriculture.

The film tells the story of the influence of improved highways upon the social, educational, religious and economic phases of life in rural communities, and the need for skilled highway engineering in bringing about the improvements.

HOUSED IN NEW HOME

CHICAGO, March 22.—The Motor Tire Sales Co., Inc., formerly housed at 1602 S. Michigan avenue, is now established in its new home at 1514 S. Michigan avenue. Increased business necessitated the move. The company now has ample accommodations for its service as a dealer in automobile accessories, tires and tubes. It is announced that W. G. Downie, former general sales manager of The Dayton Rubber Manufacturing Company, has purchased a substantial interest in The Motor Tire Sales Co., and will take an active part in its direction.

QUIT HANDLING CARS

BIRMINGHAM, March 22.—Announcement has been made by the Ewart-Brewer Company that they will discontinue the sale of cars and devote their business exclusively to the sale of automobile supplies. Ewart-Brewer formerly handled Columbia and Haynes cars.

START PROFIT-SHARING PLAN

DETROIT, March 24.—Percy Chamberlain Associates, Inc., will increase its capital stock to \$500,000, \$100,000 of which will be set aside to allow supporting dealers, their employes and the employes of motomarts to participate in the earnings of the organization. For the present only persons in these classifications will be permitted to become associates in the plan, President Percy Chamberlain said.

"We have looked forward to the day when we could devise a profit-sharing plan that would reward those whose faith and courage have made this organization possible," Mr. Chamberlain said. "There were two courses open to us. One was to accept proposals from financing interests who desired an interest in the organization, the other to offer our associates the same opportunity. We have chosen the latter course and are offering our supporting dealers and employes an opportunity to buy stock on the deferred payment plan."

THOUSANDS SEE SHOW

WAUSAU, Wis., March 24.—The second annual Central Wisconsin Auto Show was held here from Feb. 15 to 19. Forty-five different makes were represented and these attracted between 14,000 and 16,000 visitors. The admission fee was 25 cents and covered practically the cost of the show

GET CANADIAN CHARTERS

OTTAWA Ont., March 2..—Incorporations have been granted to the following joint stock companies: Roamer Motor Car Company (Canada) Limited, Toronto, capital \$1,000,000. The All Steel Wheel Co., of Canada, Limited Toronto. \$200,000. Stearns Canadian Knight Motors, Limited, Montreal, \$1,000,000.

A. _

Prog ve

CH

signs

moti

in N

5. in

tenda recei by C indic mem the prom and c to th

down day lings tors. mence Mayo leans the merce

of v rema comminent We to d M. P Rese

that

again divis Th Frida merc addr Satu ness cella

that

TE estimatten tomo

ausp

Deal

one built even mode erty barre as a were

YO State McK: to it:

thirt

A. E. A. Members Preparing To Descend on New Orleans

Program Promises Delegates to Convention Both Pleasure and Profit During Six-Day Stay

CHICAGO, March 22.—According to all signs, the spring convention of the Automotive Equipment Association, to be held in New Orleans from March 31 to April 5, inclusive, will set a new mark for attendance at these gatherings. Reports received at association headquarters here by Commissioner William M. Webster indicate that large groups of A. E. A. members are preparing to descend upon the historic southern city. They are promised an excellent bill of pleasure and educational profit from the first day to the last.

The convention proper will not get down to business until April 1, the first day being taken up with committee meetings and a meeting of the board of directors. The first general session will commence at 10 a. m., Tuesday, April 1, Mayor Andrew J. McShane, of New Orleans, and Walker Parker, manager of the New Orleans Association of Commerce, starting things off with addresses of welcome. The president's address, remarks by the commissioner and the commissioner's report are some of the first day features.

Wednesday will be given over largely to divisional meetings, and address by M. P. McNair, of the Bureau of Business Research, Harvard, being promised for that day. Mr. McNair is slated to speak again on Thursday before the jobbers' division.

y

g

n

n-

The second general session, beginning Friday, April 4, will be given over to the merchandising department, several good addresses being on the program. On Saturday, the last day, unfinished business will be attended to, along with miscellaneous matters, providing it is seen that a session is necessary on that day.

1902 OVERLAND DISPLAYED

TERRE HAUTE, Ind., March 22.—It is estimated that more than 10,000 persons attended the "quarter million dollar automobile show" given recently under the auspices of the Terre Haute Automobile Dealers' Association. Sales and prospects also broke all previous records. One of the features was an Overland car built in Terre Haute in 1902, attracting even more attention than the modern models. The antique is the private property of John N. Willys. Trucks were barred by the show management as well as accessories. Only a few open cars were exhibited.

PLAN ADDITION TO PLANT

YORK, Pa., March 18.—The United States Chain & Forging Co., maker of McKay tire chains, will erect an addition to its present plant in this city, ground for which will be broken in the next thirty days.

FRED VAN SICKLEN DEAD

CHICAGO, March 22.-Fred Van Sicklen, brother of Norton H. Van Sicklen, Vice President and General Manager of the Apperson Bros. Automobile Co., Kokomo, Ind., died here last evening. Mr. Van Sicklen was one of the best known men in the automotive industry and devoted the greater part of his time to automotive advertising. He was star advertising man with Motor Age back in the days of 1905. He was also at one time connected with the Critchfield Advertising Agency at Detroit and later on formed the Murray-Van Sicklen Company, of Chicago, which organization handled Prest-O-Lite service. For several years past Mr. Van Sicklen has devoted most of his time to selling motor cars, particularly Fords. His last connection was with the Bunnell Motor Company. Ford dealer at Gary Indiana.

Expect Many Delegates to Attend I. A. T. A. Sessions

PEORIA, Ill., Mar. 23.—Present indications are that all previous attendance records will be broken when the Illinois Automotive Trade Association holds its annual convention in Galesburg on March 31. With the program headed by Capt. Eddie Rickenbacker and with James E. Appleby, originator of the Appleby used car plan, on for an address, the sessions promise to attract not only many association members but many non-members as well.

Problems that are constantly facing the dealer will come in for much round-table discussion. A live and competent committee of Galesburg dealers will be in charge of entertainment. It is making plans for a good bill of fun at the banquet.

It is expected many of the delegates will arrive Sunday night and be ready for the opening session promptly at 9 o'clock Monday morning. Hotel reservations should be sent to E. T. Byram, Galesburg. Chicago dealers and many of the members from the northern part of the State will come in special Pullmans.

FEBRUARY ACTIVE IN SOUTH

ATLANTA, Ga., Mar. 22.—Figures received in Atlanta from a reliable source covering industrial activity in the 16 southern states during February, show the automotive industry to have exceeded the January record in construction of garages, service stations, automobile sales buildings, and new companies for these fields, the only industry in the South, save textiles, to have bettered the record for the first month of the first. Machinery distributors report the automotive industry to be the heaviest buyer of new equipment since the first of the year, with the exception of the railroads.

CHANGE SHOW DATES

MITCHELL, S. D., March 22.—Show dates for the Mitchell Automobile Show have been changed from April 17-19 to April 10-12.

Battery Manufacturers Name D. H. Kelly Association Head

Idea of Charging for Service Unanimously Approved by All at Organization Session

CHICAGO, March 21.-Eighteen battery manufacturers were represented here today at the organization meeting of the Battery Manufacturers' Association, which was held at the Congress Hotel. The need of supporting the battery dealer in constructive merchandising methods was the keynote of the meeting, the basic idea of charging for battery service being unanimously fav-To attain this ideal in the individual battery shop, it was also brought out that local associations of battery men should be fostered and that advertising copy directed to the dealer should deal with this question, while advertising to the car owner should serve to educate the public to pay a fair price for good sevice rendered.

The following officers were elected: President, Mr. D. H. Kelly, U. S. L. Battery Corp.; first vice president, Mr. R. B. Crane, Cooper Storage Battery Corp.; second vice president, Mr. R. D. Mowry, Universal Battery Co.; treasurer, Mr. T. A. Bartlett, Cole Battery Corp.; secretary, Mr. C. A. Englert, Englert Mfg. Corp.; director, Mr. F. V. Brown, Amplus Storage Battery Co.; director, Mr. A. R. Campbell, Wright Battery Co.

A resolution was adopted requesting the management of the National Automotive Service Convention to set aside one day of the May meeting in Detroit for the discussion of problems relating to electrical service.

A membership committee was appointed and their recommendation as to membership was approved. Active members shall be those manufacturers who actually make plates and assemble them into complete storage batteries. Associate members shall be composed of manufacturing companies allied with the storage battery industry, not eligible to active membership.

NEW PLANT FOR LACROSSE

LACROSSE, Wis., March 20.—The Accessories Production Co., LaCrosse, Wis., is a new Wisconsin corporation with a capital of \$50,000, organized by Julius Holley, Earl Morgan and Harry W. Robinson to engage in the manufacture of automobile signal lights and devices and a general line of automotive equipment for original and replacement purposes. A plant has been established and production started.

ABSORB SUPPLIES FACTORY

ACTON, Ont., March 23.—The Acton Machine Co., manufacturers of motor axles, driving shafts, bushings, commutators for Ford cars, unlined brake shoes, etc., has taken over the Thompson Motor Supplies factory at Acton.

Mai

Re

Re

gai

au

Fe

har

for

tha

ge

to

ce

Ja

sh

su

th

Dimmer Law Logic Is Exploded by Tests

WASHINGTON, Mar. 21.—The theory that dimming headlights is a precaution against accidents, has been disproved by the U. S. Bureau of Standards, at least in so far as the Virginia State legislature is concerned. The legislature during the past several weeks has been considering a bill requiring motorists to dim their lights when passing other motorists at night.

The Bureau of Standards experts with a committee from the Virginia senate made tests which satisfied the Southern senators that their proposed legislation would not prove beneficial.

EXPLAIN RAIL PURCHASE

. TOLEDO, March 22—High officials of the new Toledo and Western Railway Co., of which John N. Willys has become president and which is jointly owned by Willys-Overland and Wabash, say that the railroad venture is both to make money and to secure better transportation.

For many months the plant here has been hampered some by its cramped railroad facilities, its inability to get plenty of cars, and from the fact that it had to deal with the New York Central lines exclusively in shipments.

The portion of freight, it is said, which the Overland can divert to the new Wabash connecting line will put it on a paying basis at once. There also is opportunity of rate reductions and favorable divisions on through rates with Wabash because both interests will split profits.

TAX GAS FOR HIGHWAY MONEY

CINCINNATI, Ohio, March 22.—A voluntary one-cent tax on gasoline has been adopted by automobile dealers of Lexington and a number of other Kentucky cities to obtain funds to help finish the Dixie Highway. The tax went into effect March 10 and will continue for seven weeks, ending April 28. Twenty dealers signed the agreement in Lexington and similar agreements have been signed in a dozen other towns.

"DRESSING" CARS HELP SALES

BETHLEHEM, Pa., Mar. 23.—The Foering Auto Company, a Ford Dealer in Bethlehem, Pa., has had unusual results in creating interest in its showroom models by dressing up cars in the showroom not only with bumpers, wind-shield wipers and spot-lights, but with a Bethlehem De Luxe Radiator Cap on each model in the showroom. It is claimed the plan has facilitated sales.

LAUNCH MEMBERSHIP DRIVE

ST. LOUIS, Mo., Mar. 23.—At a monthly meeting of the Associated Automobile Service Companies, of St. Louis, a membership campaign was launched. The campaign was planned by Edward S. Breen, Travers & Skaggs Garage Co., and will be conducted by four teams captained by William Brown, Brown's Garage, Harry K. Hotze, South Side Garage, Albert L. Jagemann, Atlast Auto Repair Co., and Conrad Loesch, Loesch Auto Repair Co.

It was impressed on the team members that each applicant for membership would be carefully scrutinized and two references would be required for each.

"We want a complete membership of the reliable, well conducted automobile service companies in St. Louis, rather than a large membership of irresponsible firms", said George C. Porter, president of the Association.

New Eight-in-Line Engine Is Produced by Chicago Maker

CHICAGO, March 22.—Another eight-in-line engine has been added to the list of those made by American parts manufacturers. This product is placed on the market by the Excelsior Motor Manufacturing & Supply Co. of this city. It has a nine-bearing crankshaft and is fitted with overhead camshaft—a construction by an overhead camshaft—a construction similar to that employed in the four-cylinder engine built by the same concern.

The new product has a 3% in. bore and 4¼ in. stroke and is said to develop in excess of 90 b.hp. at 2500 r.p.m., which is approximately the speed of maximum power.

Tools for the manufacture of the engine are now being made by the Taft Pierce Co. of Woonsocket, R. I., where the engine will be manufactured initially.

Cylinder block and upper crankcase are cast integrally in iron. Underpan, valve cover, bellhousing and gear casings are of aluminum. The camshaft is driven by spiral bevel gears and a vertical shaft. The latter also drives through helical gears a cross shaft for timer and water pump and a three-blade aluminum fan. The lighting generator is driven by chain off the front end of the crankshaft. Pistons are of aluminum alloy as are also the forged connecting rods. A high-pressure lubricating system furnishes oil to all bearings, including those on the piston pins.

REPORTS AGENCIES ACTIVE

ST. LOUIS, March 23.—General Sales Manager Fred H. Rengers, returned from a trip to the Atlantic Sea Board and principal points of distribution, reports an unprecedented pre-spring activity in the delivery of Moon cars, which presages a new record-breaking demand for spring deliveries that will tax even the greatly increased production facilities of the Moon factories.

Salesmen Big Buyers During February

DETROIT, March 22.—Sales of Paige and Jewett cars in February according to occupational classification of buyers show salesmen leading with 11 per cent of the total. Mill workers, machinists, mechanics, etc., are the second largest purchasers with 10.5 per cent. Percentage of sales listed as going to farmers is 4.6 per cent, this being eighth on the list. Other buyers are classified as follows:

Executives	6.7
Merchants	6.6
Real Estate	6.5
Building Trades	6.3
Women	5.4
Physicians	3.7
Clerks	3.3
Groceries-Meats	2.7
Railroad Men	2.6
Engineers	2.6
Hotel-Restaurant	2.3
Retired	2.2
Civil Service	
Taxi-Livery	1.9
Oil	
Garage Men	1.6
Bankers-Brokers	1.4
Bakers	.9
Lawyers	.7
Teachers-Clergy	.5
Drugs	.4
Miscellaneous	4.3
Occupation not given	7.8

URGE PAINT STANDARDIZATION

WASHINGTON, Mar. 22.—Standardization of paint and varnish colors, used in the automobile and carriage industry, was recommended this week at a conference of approximately 80 per cent of paint and varnish manufacturers, meeting with the officials of the Department of Commerce.

It was decided that the shades and tints of automobile paints and enamels could be limited to ten varieties. Varnish stains, such as are used in some phases of the automobile manufacturing industry, were reduced to eight shades; oil stains, to 10 shades, and metal enamels to 14 shades and tints.

MILLIONS VISIT FORESTS

WASHINGTON, Mar. 22.—The importance of the automobile as a means of recreation and transportation through national forests, is shown by statistics compiled by the U. S. Forest Service.

Figures of the Service show that during 1923, there were 10,670,000 visitors in the national parks, of which 8,125,000 came in privately-owned cars, while motor busses accounted for an additional 900,000, the remainder being hikers.

f

in

ry,

et-

ent

nd

els

ar-

me

ng

es;

m-

m-

ns

gh

ics

1F-

ile

ıal

Record Activity in Motor Industry Seen by Bankers

Reports in Survey Show Unusually Large Volume of Business for This Season

WASHINGTON, Mar. 22.—What is regarded as a record for activity in the automobile industry is reported to the Federal Reserve Board by member banks, in the survey of current business for March. The Board's survey declares that automobile manufacturers report a large volume of business for this season of the year, while production of passenger cars and trucks during January totaled five per cent more than in December and 30 per cent more than in January, 1923.

The records show that both output and shipments were greater than during any previous January. This is attributed, the survey states, to relatively mild weather, the increasing popularity of closed cars, better roads, easier terms of sale, well-maintained industrial employment, and somewhat improved agricultural conditions. Business in general is prosperous, the Board finds, basing its deduction on the fact that manufacturers are selling large numbers of trucks.

Increased prices by a great many car manufacturers is another factor that undoubtedly had a good influence on the market, the survey says: "This has no doubt induced many purchases from those who believed other increases would follow," the Board declares, continuing: Stocks Not So Large

"During the past month manufacturers state that stocks of finished cars were not large for this season, despite heavy production. Yet a number of middle western dealers, reporting to the Chicago Federal Reserve Bank, show that they held 30 per cent more new cars and 24 per cent more salable used cars at the first of February than they did a year earlier. Inventories were also larger than at the end of December. Total dollar sales of new automobiles during January by manufacturers in the Chicago district were over 20 per cent greater than in December and 45 per cent more than January, 1923."

The tire and tube market is also reflected in the prosperity enjoyed by the automobile industry, the survey finds. Production has increased the past month to the highest point since Spring. Shipments were smaller than output and, consequently, stocks increased for the first time in several months. Some prices on balloon tires were reduced in January, but standard sizes remained relatively steady.

RECEIVER IS APPOINTED

DETROIT, March 24—Roland Crandall of Chicago has been named receiver of the Transport Motor Truck Co. of Mt. Pleasant, Mich., by Federal Judge Tuttle.

Speaking of Ticket Lines—Read This

BOSTON, Mar. 22,-When 8000 see the door to an automobile show closed as they clamor for entrance; when thousands stand in line on a cold evening making three lines whose total length from the extreme entrance to the end of the line is more than a third of a mile long in order to pay to enter the show; when the show building is taxed to capacity; when the attendance for one day runs above 43,000; when dealers and salesmen were among those shut out it is proof positive that people are interested in buying automobiles.

That is what happened at Boston a few days ago when throngs stormed the building and pushed a cordon of police aside seeking entrance.

FORD TO SALVAGE WOOD

DETROIT, March 22—Orders have been issued by the Ford Motor Co. to its branches throughout the country to save all wood coming in and to use precautions to see that no board is broken. The company plans to salvage this wood, investigation having disclosed that 89 per cent of the wood now thrown away by Ford branches as useless can be used.

The company's lumber salvage department at the plant here has been experimenting for the past month and has discovered that where 36 carloads of wood were taken away each week as useless, except for firewood, thirty of these carloads can be utilized. The salvaged wood can be used for boxes and crates. Tests have shown that 93,000 board feet of lumber can be salvaged each week—quite an item, even though the company uses 300,000,000 board feet of lumber a year.

PURCHASE UP TO STOCKHOLDERS

NEW YORK, March 22.-Stockholders of the Marlin-Rockwell Corp. of New York City will be asked at a meeting March 28 to ratify a deal made by the corporation executives for the purchase of the property, rights, privileges and franchises of the Gurney Ball Bearing Co. of Jamestown, N. Y. The price to be paid is \$2,722,800 par value of preferred stock and 133,683 shares of no par value common stock of the Marlin-Rockwell Corp. and the assumption by the latter of all the debts, liabilities and obligations of the Gurney company. The stockholders also will be asked to authorize an additional stock issue to cover the purchase price of the Gurney company. This increase is necessary because at the present time the Marlin-Rockwell Corp. is authorized to issue only 89,251 shares of no par value common.

Chicago's Next N.A.C.C. Show May Be Held in One Building

Completion of Addition to Coliseum Possible by Next January, Says S. A. Miles

NEW YORK, March 17.—A proposed addition to the Coliseum will make it possible to house the next Chicago national automobile show in one building and do away with the necessity of using the First Regiment Armory to care for the overflow, as has been the custom for years.

S. A. Miles, general manager of shows for the National Automobile Chamber of Commerce, has been advised of this prospect by the owners of the Coliseum who state that if the deal now pending goes through, and they think it will, that it will be possible to have the enlarged building ready for use next January, when the next N. A. C. C. show is scheduled to be held.

The proposed enlargement is made possible through the availability of the big tract, 75 by 160 to the north of the present Coliseum, caused by the fire which partially demolished the old Grace Episcopal Church which has been located there for years. It is proposed to build the Coliseum addition on this land, putting up a three story building, which will be made a part of the present Coliseum by archways on the first floor and from the gallery.

Mr. Miles is not planning to use the third floor of the new building, for the other two floors will give him 25,000 square feet of space, which is about the area available in the Armory. A check-up on the attendance at the recent shows in New York and Chicago proves their strength with the dealers, for New York attracted 11,000 dealers and Chicago 9,000. Mr. Miles states: Chicago, despite being 2,000 behind New York in the count, was thoroughly representative of the industry as a whole, as all but four States were represented among the retailers who attended the Chicago affair.

PREDICTS NEW TRUCK RECORD

DETROIT, March 22.—Indications in the truck field are for the best year that branch of the industry has known, declares Vance H. Day, general sales manager of General Motors Truck Corp. As reason for this he points out improved business conditions generally, greater use of motor trucks in all lines of industry, and the elimination of discarded war equipment from competition.

A new factory branch has been opened in Cleveland to take care of increased business in that territory. O. W. Crawshaw, district sales manager, is in charge. In the first two months of the year the factory reports sales throughout the country were 21 per cent greater than last year. Unfilled orders on hand are the largest for the season the company has ever had,

Mai

G.

Le

Cor

ing

sale

foll

the

mai

ane

ecu

uni

ces

ma

str

and

see

acc

ma

ing

ed

nes

acc

tur

DOI

8 8

spe

spe

abl

of

sig

tio

its

the

to

pre

pro

sin

Ole

sid

der

TAS

Co

ide As

Flo

C

Crawford Passes Out of Picture After Twenty Years; Makers Say Dagmar Is to Take Its Place

HAGERSTOWN, Md., March 17.—The M. P. Moller Motor Car Co. is the new title selected for the former Crawford Auto Co., which marks the passing of a name that has been on the roster of the industry since 1904. With it goes Crawford as the name of a car, as it has been determined to call the company's product the Dagmar from now on.

The Dagmar has been on the market for several years, being built in the same factory as the Crawford, but it was not until recently that it was decided to drop the Crawford from the picture altogether. This move followed the decision of M. P. Moller of this city, who has been the sole owner of the Crawford Auto Co. since

1921, when he took it over to protect his holdings in the concern.

Mr. Moller recently purchased a new plant in this city and following this he decided to change the name of the company also. He has decided to add to the Dagmar line by bringing out a smaller car to sell at \$1,600, while continuing the larger Dagmar which sells at \$4,500. In addition his company will manufacture the Luxor taxicab for a New York transportation company, the contract calling for 1,500 cabs. It is stated that the company will make fifty of the large Dagmars and 300 of the smaller ones this

PENALTY HUSTLES THEM UP

SACRAMENTO, Calif.—Motor vehicle registration in California up to midnight of March 10 is announced by Will H. Marsh, chief of the division of motor vehicles, to have amounted to 1,065,000. Registration was expedited this year by the new law which imposes a penalty of 100 per cent on registrations not renewed before March 2.

The new figures give the first accurate estimate of the number of trucks in use in California. Previous to 1924 the records of the division have not distinguished between trucks and passenger cars. The estimate of March 1 gives 912,500 as the number of passenger cars, and 118,50 as the number of trucks. The truck figures, however, include taxicabs and other passenger vehicles operated for hire.

On the basis of the estimated registration to date Marsh estimates that 1,500,-000 cars will be the 1924 record and is making plans to provide that number of sets of license plates.

ARMORED CARS IN POLICE WORK

PHILADELPHIA, March 22—Six armored Ford cars, built according to specifications furnished by Brig. Gen. Smedley D. Butler, commissioner of public safety, have been put into service by the city of Philadelphia as bandit-chasers and it is General Butler's plan to increase this fleet to 90.

The entire shell of the body of the Ford bandit-chaser is lined with one-eighth inch special steel and the space between the armor plating and the outside of the car is packed with loose cotton and coarse hair to retard the velocity of bullets. Armor plate also covers the cowl and runs up as high as the lower portion of the windshield. The upper portion is in two sections of bullet-proof glass and wind-wings have been provided, also of bullet-proof glass.

Acceleration and power tests have shown that this special Ford can do a mile from a standing start in 1 minute 31 seconds.

Demand for Colors Points to Woman

FORT WORTH, Texas, Mar. 23.— The annual spring show of the Fort Worth Automobile Dealers' Association surpassed anything of the kind ever staged here before from both the point of attendance and enthusiasm.

Most of the cars sold or eagerly sought were those of unusually vivid color and with rather loud trimmings. Dealers assert that this demand was due to the influence of woman in the market. Taken from reports of exhibitors the moderately priced closed cars in bright colors, equipped with balloon tires, four wheel brakes and, perhaps, disk wheels, were the favorites.

ADVANCE OPEN MODEL PRICES

INDIANAPOLIS, Mar. 22.—Effective March 10, the Nordyke & Marmon Co. announced an increase of \$110 on all open models of Marmon cars. The old and new prices are shown in the following table:

			Price	Price
2	Pass.	Speedster	\$2985	\$3095
4	Pass.	Speedster	2985	 3095
4	Pass.	Phaeton	27.89	2895
7	Pass.	Phaeton	2789	2895

"SLEEPLESS DRIVE" HIS STUNT

FLINT, Mich., March 24—Seven days and nights of constant driving, with chains binding him to the wheel of his Buick, is the unique "stunt" with which an enterprising individual known as "Daredevil" Haynes has been regaling the citizens of New Orleans. It is reported that Haynes' "sleepless" drive was made under the constant vigil of his wife, formerly a trained nurse. In the accomplishment of his purpose, Haynes claims a new record.

Indiana Passenger Car Sales Show Gains During February

While Hoosier Volume Forged Snugly Ahead, Figures Covering Illinois Reveal General Losses

CHICAGO, March 19.—February passenger car sales in Illinois, as revealed by figures on new car registrations, were 29 per cent lower than in January; in Indiana, however, there was a 22 per cent gain. Each class in Illinois registered losses, while the reverse was true in Indiana. Many of the big Chicago distributors and dealers reported an exceptionally heavy demand during February, but this is not reflected in the registration figures because a considerable portion of the orders called for future delivery.

Losses in Illinois ranged from 21 per cent on Fords and other low priced cars to 44 per cent on the high priced vehicles; in Indiana the smallest gain registered was on low priced cars (excluding Fords), of 4 per cent, to 38 per cent on those in the medium price class. Medium priced cars in Illinois showed a loss of 35 per cent.

Percentages of loss and gain in the various price classes for the two states were as follows:

	Illinois Loss
Fords	21%
Low (Excl. Fords)	21%
Medium	35 %
High	44%
Total sales	29%
	Indiana Gains
Fords	15 %
Low (Excl. Fords)	4 %
Medium	38%
High	16%
Total sales	22%

Following are the detailed registration figures:

Month January February	4,101		Med. Price 5,871 3,762	High Price 1,013 567	Total 13,172 9,254
Total	7,302	3,911	9,633	1,580	22,426
		INDIA	NA		
Manth	Bonda	Low Excl.	Med.	High	Makal

		Low			
		Excl.	Med.	High	
Month	Fords	Fords	Price	Price	Total
January	4.106	1.007	1.259	104	6,476
February	4,748	1,353	1,743	121	7,965
Total	8,854	2,360	3,002	225	14,441

Illinois statistics were compiled from data furnished by Robinson's Advertising Service, Springfield, Ill.; Indiana registrations were obtained from information supplied by Indianapolis Auto Trade Association, Indianapolis, Ind.

SIX YEARS FOR AUTO THIEF

HARTFORD, Conn., March 23.—After pleading guilty to theft of two automobiles, Henry P. Shugrue of Somerville, Mass., was sentenced to six years in the Connecticut state reformatory by Judge William M. Maltbie in the superior court. State's Attorney Hugh M. Alcorn asked the court for a definite sentence rather than an indeterminate one and the six years was meted out.

G. M. C. Without Set Policy Respecting Accessory Sales

Leading Executives Think It Is Questionable Whether All Units Could Apply Plan

DETROIT, March 22.—General Motors Corp. has not committed its care producing units to any set policy on accessory sales, and whether any of the other units follow the lead of Olds Motor Works in the sale of accessories to its dealers is a matter of individual determination. It is questionable in the minds of leading executives of the corporation whether all units could apply this accessory plan successfully and it will be left for each to make its own decision.

General Motors, it is emphasized, is strictly in the business of manufacturing and selling cars and is not nor does it seek to be in the business of selling accessories. The adaptation of the Olds line to carry a certain number of standard accessories is not a movement by that unit to enter the accessory business but is designed solely to broaden the market for the car. Olds executives, acting under the individual authority granted to each unit to conduct its own business, choose to provide for standard accessories as offering greater opportunity for car sales.

It is further emphasized by the corporation that Oldsmobile is not handling a general line of accessories but only the special equipment used in its sport and special models, which it is making available for the entire line at the discretion of the buyer. The car has been redesigned for the installation of any or all of these accessories, so that there will be no damage to the car in the installation, or large service charge to the buyer for the work.

The question of each unit designing its product for use of certain accessories and in turn, the sale of these through the factory, has been considered informally, it is known. There was question in some executives' minds as to results to be gained and the point was never pressed, it being left for the future to determine whether the accessory combination could be used successfully in prompting sales in their particular divisions.

In the meanwhile the experience of the Oldsmobile division in its plan will be carefully studied. Executives of the other divisions will have opportunity to consider the proposition according to the developments at Olds and their course to a large extent will be governed by the results there

BATTERY DEALERS ELECT

HARTFORD, Conn., March 23.—C. A. Tinkham of the Giant Storage Battery Co., Hartford, Conn., was elected president of the Hartford Battery Dealers' Association at a recent meeting. Harold A. Preston was elected vice-president and Floyd C. Standish secretary and treasurer.

Ontario Buys Most Cars

TORONTO, Mar. 23.—Statistics compiled by the Automotive Industries, of Canada, the N. A. C. C. of the Dominion,

show that in 1923 Ontario bought nearly
as many cars as all other provinces. The
table showing the 1923 distribution com-
pared with 1922 totals is as follows:

1	Passenger	Commercial	Total	Total
Province	Cars	Cars	1923	1922
Ontario	.245.815	28,612	274,427	234,497
Quebec		8,961	68,959	58,66T
Saskatchewan		2,086	63,017	58,836
Alberta		2,191	41,933	39,964
Manitoba		2,428	41,515	41,105
British Columbia		6,000	39,500	34,500
Nova Scotia		1,999	18,103	15,884
New Brunswick	15,409	1,193	16,602	13,513
Prince Edward Island		99	2,430	2,146
Total	.512,917	53,569	566,486	499,022

REPORT SHOWS GROWTH

AKRON, Ohio, March 20.—Sales of the Miller Rubber Co. for the fiscal year ending Dec. 31, 1923, were \$29,188,523 as compared with \$24,754,344 for the previous year, an increase of 18 per cent. in dollars and a greater increase in pieces, it was announced by Jacob Pfeiffer, president, at the company's annual meeting. Operating profit, depreciation, adolescence and income tax totaled \$2,060,009 as compared with \$2,756,607 for the previous year.

After providing for the normal preferred dividends, profits are equal to \$25.36 a share on common as compared with \$32.60 a share last year. This, by payment of deferred dividends and declaration for payment of all deferred dividends and declaration for payment of all deferred dividends, absorbed \$21.09 a share, leaving a balance of \$4.27 a share for surplus.

TRUCKS GOING STRONG

INDIANAPOLIS, March 23-Both independent truck dealers and distributors and the factory branches which play an important part in truck distribution in central Indiana report brisk business during the first two months of the year with good prospects for a much better year than developed during 1923. As practically all the heavy-duty and larger size trucks of central Indiana are sold from Indianapolis and distributed from local dealers, distributors and branches here the conditions of local concerns very clearly reflect the entire truck sales condition throughout Indiana with the exception of the northern tier of counties and a part of the southern tip of the

AUCTION BID REJECTED

BUFFALO, March 22—Creditors in the case of Herschell-Spillman Motor company of North Tonawanda, have opposed acceptance of the bid received at a public auction of real property machinery of the plant, of \$45,000 cash, subject to mortgage of \$235,000 with interest at six per cent. The trustee was directed to secure private offers on the whole property or in parcels and report at the next meeting.

Rubber Companies Publish Figures on 1923 Business

AKRON, O., March 28.—Public announcement of the results of business done during 1923 by the Miller Rubber Co. and the Seiberling Rubber Co. completes the record for the more important companies in the rubber city.

The Miller Rubber Co., as predicted, did \$29,188,523 worfh of business as compared with \$24,764,344 in 1922 while operating profit, after all charges including \$919,736 for depreciation, amounted to \$2,060,009 or \$25.36 a share common compared with \$2,756,607 or \$32.60 a share common shown during the previous year.

Seiberling during the second year of business sold \$5,782,321 worth of products as compared with \$3,845,779 sold during the previous and first year of the company's history. Net profit before charges during the year just closed amounted to \$124,202 as compared with similar item during 1922 of \$56,878. Net after charges for 1923 amounted to \$12,526.

The Miller company in its statement given out by President William Pfeiffer calls attention to the fact that the advent of balloon and semi-balloon tires will require considerable enhancements of the company's fixed assets during the present year.

Seiberling Rubber in its statement calls attention to the low prices which obtained on tires during the second half of the past year which account for the low profit for the year. Although it is not mentioned in the statement, the figures also reflect the fact that its plant at New Castle Pa. has not been operating during the past year.

NEED MOTOR FREIGHT DEPOT

CLEVELAND, March 20.—The development of motor freight in this city has progressed to the point where a freight terminal is demanded, and that need is to be satisfied by Otto F. Knutsen and William E. Hunger who compose the Knutsen Motor Trucking Co. They are to build at once a freight terminal at Orange avenue and E. 21st street.

Marc

Go

Wa

ernn

the !

subs

the '

larg

cour

trac

in fa

addi

T

was

ceiv

per

tatir

000

per

clair

clair

afte

abor

the

Rec

on (

cert

ons

\$3.2

ther

the

ing

Due

duc

ledo

tota out est

any

Jul

ado

zati

fer

fer

nes

and

sto

Mo

pla

car

Pla

at

Here's What Farmer Thinks of Motor Devices

WASHINGTON, Feb. 27.—The first large survey of the farmers' use of automobiles has been completed by the Bureau of Agricultural Economics, Department of Commerce, showing how widespread is the use of the passenger car and truck among present-day farmers. From carefully selected areas the department gathered data showing the part that the motor vehicle plays in the farmers' existence.

In the Atlantic Coast areas 58 per cent of the farmers have automobiles. In different areas in the Middle West 70 to 85 per cent own cars, while in Washington and Idaho 86 per cent of the farmers have adopted this improved method of transportation. The only region where less than half the farmers owned automobiles was in the dry farming wheat area which has suffered financially since

1917.

The survey shows that in Pennsylvania 58 per cent of the farmers own a passenger car or truck; Kansas 85 per cent; South Dakota 70 per cent; Montana 48 per cent; Colorado 85 per cent; Washington and Idaho 86 per cent.

The figures indicate that the touring car is the farmers' car for all around use. Next to the touring car trucks were most used, running up to about one-fourth of all machines in some areas, though less important in others. Roadsters, sedans and coupes were less frequently reported, rarely totaling one-tenth of all farmers' machines.

The following shows the prices paid for machines and the average annual cost of operating touring cars on farms in the different areas:

States in which areas were located

	Pennsyl- vania	Kansas	South Dakota	Montana	Colorado	Washing- ton
Average price paid for						
machines	. \$874	\$757	\$648	\$594	\$709	
Cash costs of operation:						
Gas	66	62	40	49	58	
Oil	. 9	9	7	10	9	
						\$78
Tires	38	28	31	21	34	40
Repairs	31	. 22	20	25	26	44
License fees	10	. 9	14	. 10	6	15
Total cash čosts	154	130	112	115	133	177
Depreciation	116	98	102	74	84	112
Total costs	. 270	228	214	189	217	289

It would indicate that gas and oil together made up approximately half of the cost of operating the machines, tires, repairs and license fees making up the balance. The survey showed that few farmers carried insurance on their cars.

The average cost of operating touring cars on farms in the different areas, as shown by the survey, is as follows:

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		nsyl- ania	Kar	sas		uth	Mon- tana	Colo	rado
	Small	Medi- um cars	Small	Medi- um cars	Small cars	Medi- um cars	Small	Small cars	Medi- um cars
Average purchase price of machines	\$542	\$854	\$534	\$1,230	\$603	\$1,102	\$530	\$501	\$1,125
Average age in years Average estimated life		4.0	4.1	3.6	5.8	5.2	4.8	4.2	4.0
in years		8.3	7.7	8.2	7.4	6.7	7.9	7.5	7.8
Gas Oil	\$63	\$63 8	\$62 9	\$64	\$44	\$28	* \$51 12	\$57	\$73
Tires	33	44	26	32	27	43	23	10 29	59 59
RepairsLicense fees		38 11	21 8	24 11	21 13	20 16	27	25 5	33
Total cash costs		164	126	139	112	113	122	126	181
Depreciation	72	103	71	150	81	164	67	67	144
Total costs	211	267	197	289	193	277	189	193	325

TROLLEY STEPS OUT FOR BUS

GRASS VALLEY, Calif., March 22.— The six-mile street car line between this place and Nevada City, which has been in operation for 27 years, has been dismantled and bus service substituted by the street car company. A 30-passenger coach makes hourly trips and is meeting with general approval.

LIKE N. A. D. A. SYSTEM

ST. LOUIS, Mar. 23.—The accounting system of the N. A. D. A. is being warmly received, according to Lynn Shaw, assistant general manager, who recently returned from a trip to carry the gospel of 5 per cent net profit to automobile dealers. Shaw said that throughout the district traveled many dealers are instituting the modernized plan.

Philadelphia Company Will Manufacture Mercer Cars

Already Owns Good Will, Name and Other Assets—Next to Locate Plant

TRENTON, N. J., March 17.—The Curran-McDevitt Co., of Philadelphia, which has been the Mercer agency in that city for the past three years, aspires to become the manufacturer of Mercer cars, continuing a long business which was interrupted a year ago through receivership proceedings. As a step in this direction, the Philadelphia company today bought for \$40,000 the unencumbered assets of the Mercer Motors Co. of this city, valued at \$75,000 by a recent inventory. The purchase included the Mercer good will and name, inventory, raw material and working procss.

Now it remains for the Philadelphians to secure the plant, machinery, equipment and land, which is to be disposed of at a separate sale. If they make this purchase they intend, it is stated, to manufacture Mercer cars in the local plant. Failing, they will locate somewhere else.

The Mercer real estate, comprising the factory proper and thirteen acres of land, is encumbered by a mortgage of \$450,000, held by the United States Mortgage & Trust Co. and it is proposed to sell this as a unit. With this end in view the bondholders have until April 2 to show cause why the sale should not take place.

When this sale takes place the affairs of the old Mercer Motors Co. will be wound up. It is said that the secured creditors will get only four or five cents on the dollar while the stockholders will get nothing. When the receivership was declared the company owed \$1,7000,000 to the unsecured creditors.

HEADLIGHTS ARE DISCUSSED

BOSTON, March 20—Motor car headlights, their use and abuse, provided the principal topic of discussion at the New England Section meeting of the S. A. E., at Boston. The findings of the U. S. Bureau of Standards by R. E. Carlson were presented and the points stressed illustrated. The discussion was similar to that at the meeting of the factory service managers and S. A. E. at Dayton last fall.

GLANCY INTERESTS EXPAND

JANESVILLE, Wis., March 20.—The Glancy Malleable Corp. of Waukesha, Wis., which a year ago took over the Waukesha malleable foundry of the Samson Tractor division, General Motors Corp., has now taken over the gray iron foundry built as part of the new plant of the Samson Tractor Co. at Janesville, Wis., and is converting it for malleable casting processes.

rs

d

ch

ty

S,

28

is

0-

n-

10

у.

18

al

d

Government Claim Alone In Way of Willys Settlement

War Contracts With Subsidiary for \$1,500,000 Stands in Way of Dissolution

NEW YORK, March 17.—Only a Government claim of about \$1,500,000 against the Duesenberg Motors Corp., one of its subsidiaries, prevents the dissolution of the Willys Corp. receivership, one of the largest in the industrial history of the country. This is on account of war contracts and a final settlement of this claim in favor of the Government might require additional payments.

The present status of the corporation was brought out last week when Receiver Francis C. McCafferty paid a 10 per cent dividend to creditors, necessitating the disbursements of about \$1,500,000 and which brings the total to 100 per cent on the dollar on all adjudicated claims. This payment liquidates in full claims of \$15,300,000 which remained after reductions of the original claims of about \$30,000,000 which were filed against the corporation.

Receiver's Accounting

An accounting by the receiver showed on Oct. 5, 1923, cash of \$793,930, treasury certificates of \$1,500,000 and miscellaneous investments of \$992,075, a total of \$3,286,005. Present indications are that there will remain a substantial equity for the first preferred stockholders of the Willys Corp. when the final accounting is made, if the claim against the Duesenburg Motors is disallowed or reduced. When the corporation went into its receivership on Nov. 26, 1921 at Toledo, it owed banks over \$10,000,000 and the balance of \$5,000,000 in debts was due largely to merchandise creditors. The total of \$15,000,000 which has been paid out by the receiver is probably the largest cash distribution ever made under any receivership in New York courts.

The Willys Corp was incorporated July 24, 1917 in Delaware as the Electric Auto-Lite Corp. and the present name adopted in September, 1919. Its capitalization consisted of 5,000,000 shares of common of no par value, \$15,000,000 8 per cent cumulative convertible first preferred, par \$100 and \$10,000,000 7 per cent cumulative convertible second preferred, par \$100. It acquired the business and assets of the Auto-Lite Co., of Ohio, engaged in the manufacture of electric starting and lighting systems and in 1919 it secured the entire capital stock of the New Process Gear Corp. of Syracuse, N. Y. and of the Duesenberg Motors Corp. with plants at Elizabeth, N. J., and Poughkeepsie, N. Y. It also planned the manufacture of the Chrysler car at Elizabeth.

Plant Sold at Auction

Following the receivership, the plant at Elizabeth was sold at auction to W.

C. Durant for \$5,525,000 and at present is being used for the manufacture of Star and Durant cars. The Poughkeepsie plant was bought by C. O. Miniger, president of the Electric Auto-Lite Corp. for \$300,000, while Durant interests purchased the plant and assets of the New Process Gear Corp. at Syracuse, for \$2,-100,000. This completed the liquidation of the Willys Corp. so far as physical properties were concerned.

List of Officers

Officers of the Willys Corp. were: John N. Willys, President; W. P. Chrysler, executive vice-president; J. R. Harbeck, vice-president; C. O. Miniger, vice-president; C. R. Burt, vice-president; Jay V. Hall, vice-president; D. T. Welsh, treasurer and C. B. Mertz, secretary. The directors were Messrs. Willys, Harbeck, Miniger, Kepperley, Mertz, Chrysler and Hall

Peckham Again President Of Cleveland Association

CLEVELAND, Mar. 22.—G. G. G. Peckham, head of the Ohio Buick Co., has been re-elected president of the Cleveland Automobile Manufacturers and Dealers' Association. This is the third successive election of Mr. Peckham.

Dan. J. Nolan, of the Cleveland Cadillac Co., was elected vice-president; R. J. Schmunk, head of the R. J. Schmunk Co., Hudson and Essex distributors, treasurer, and Herbert Buckman was again chosen secretary-manager. Mr. Buckman was given a vote of thanks for the successful manner in which he had directed activities of the association.

Broadcasting Approved

Walter F. Wright, president of the Walter F. Wright Co., Willys-Knight and Overland distributor, and W. Pitt Barnes, head of the Barnes Motor Co., Dodge distributor, were elected to the board of directors. C. A. Forster, of the Packard-Cleveland Co., was re-elected a director. Directors remaining on the board are Birkett L. Williams, O. C. Tyner and Warner M. Bateman. Broadcasting by radio of instruction to owners on how to care for their cars during winter months met with hearty approval of owners boasting also of radio sets.

BOOSTING FORDS WITH FILMS

DETROIT, March 22.-Ford Motor Co. is sending copies of its film, "The Road to Happiness," to all branches in the United States and is arranging for general showing. The picture is designed to promote interest in better highways and is produced by the Ford Motion Picture Laboratory in conjunction with the Bureau of Public Roads, U. S. Department of Agriculture, the Highway Educational Board and the National Automobile Chamber of Commerce. President Coolidge appears in the film, presenting a scholarship to the boy hero of the story. The use of the film is free to all interested in the promotion of improved high-

General Prosperity Is Noted By Paige-Detroit Executives

Definite Proof of Optimism and Confidence Seen in Volume of Advance Purchases

DETROIT, Mar. 24.—A summary of reports by Paige-Detroit Motor Car Co. executives in several sections of the United States indicates general prosperity in 1924, says H. M. Jewett, president. Definite proof of the optimism and confidence is found in advance purchases and orders. Sales in December, January and February were 90 per cent more than in these months a year ago and demand for March deliveries is the largest the company has known.

Vice President F. L. Jewett, who is on the Pacific Coast, reports business in that section is booming and that orders from California in particular reflect this prosperity. Los Angeles is said to have ordered 700 Paige and Jewett cars for February delivery and that this number will be increased in March.

S. L. Depew, controller of the company, after examination of conditions in the trade territories of New York, Boston and Philadelphia reports the outlook excellent.

Henry Krohn, vice president in charge of sales, after a tour of the central west, says that while business will not reach boom proportions due to wheat prices and market conditions, it will double last year's.

C. B. Gaunt, following a trip south, reports conditions improved generally in that section, and that better prices for cotton, tobacco and other products have opened up a good market for cars.

OAKLAND DEALERS GATHER

WASHINGTON, Mar. 15.—Seventy-five Oakland dealers from Virginia, West Virginia and Maryland were the guests of the District Oakland Company, distributors, at a recent meeting held in conjunction with the Washington Auto Show.

At a banquet at the Roosevelt Hotel plans for the Washington territory were outlined by E. M. Wallace, president of the District Oakland Company, and W. E. Fellows, advertising manager of the Oakland Motor Car Company. The dealers were also addressed by W. J. Kennedy, of the General Motors Acceptance Corporation, and G. O. Leonard, of the Campbell-Ewald Company, Oakland advertising agents.

ASSOCIATION HEARS TALKS

BALTIMORE, Md., March 19.—A large number of the members of the Baltimore Automobile Trade Association attended a meeting last week at which Lynn Shaw and P. E. Drury, officials of the National Automobile Dealers' Association, spoke. Mr. Shaw spoke on "Five Per Cent to the Automobile Dealer," and Mr. Drury's subject was "Getting the Most Out of Your Business."

Mar

C.

Deca of h in S the I Co. cett, D. C

R.

Ci

Auto the in B

H

mob

year Iow resu from

H

the fied

J. ford Cou ber nois He

Toh sign inco part

app divi Hai

up and

Co. san pre and Car bel

ob

th

tic

19

du

as

in

by sh

D

N

tì

BUSINESS NOTES

The Chattanooga Battery Box Co., formed recently at Chattanooga, Tenn., with \$100,000 capital, will construct a large plant for the manufacture of battery boxes, according to L. K. Wert, president. The plant will cost about \$50,000, including machinery. Daily output will be 30,000 battery boxes.

Edward N. Paxton and William B. Duke, of Independence, Mo., have sold their interests in the Paxton, Duke & Bradley Co., motor car business, to John B. Bradley, who has been a member of the firm the past seven years, and Walter E. Schulenberg of the Schulenberg Tire Co. Both Mr. Paxton and Mr. Duke will retire from active connection with the business.

Jordan Motor Car Company have declared a regular quarterly dividend of 75 cents a share on the 125,000 shares of Jordan Motor Company common stock which is at an annual rate of \$3 a share. This is equivalent to \$21 a share on the old common. Regular quarterly dividends are payable March 31.

Doehler Die Casting Co. of Brooklyn announces acquisition of two new plants, one at Batavia, N. Y., and the other at Pottstown, Pa. The Light Manufacturing & Foundry Co., which will operate as the Light Manufacturing & Foundry division of the Doehler company, specializing in the production of zinc alloy die castings. The Batavia plant will produce aluminum die castings.

The H. A. Stahl Co., one of the largest real estate firms in Cleveland, has submitted a bid of \$585,000 for the Standard Welding plant of the Standard Parts Co. The bid includes a flat sum of \$575,000 for the plant and the assumption of \$10,000 in unpaid taxes. This is \$35,000 higher than the bid submitted by Andrew Squire, local attorney. A hearing on the bids submitted has been postponed by Federal Judge D. C. Westenhaver to March 19.

haver to March 19.

United States District Court of the Northern District Division of Ohio has granted an immediate injunction and ordered an accounting in favor of the Williams Bros. Aircraft Corp., of San Francisco, against the Michon Accelerator Co., of Toledo, now known as the J. H. M. Michon Co. The Pacific Coast concern claims infringement of its patent No. 1,284,523, covering the Williams accelerator for Ford cars. J. H. Michon announces that he is making preparations to appeal the decision to a higher court and intends to ask for a stay of injunction.

The H. R. Cole garage Manito III, was totally

The H. B. Cole garage, Manito, Ill., was totally destroyed by fire March 8, with a loss of \$40,000. Twenty cars on the first floor were saved by employes but scores of machines in the second floor repair department were ruined. The loss on floor repair department were ruined. The loss on the building and part of the equipment is covered

The National Securities Co., Cedar Rapids, Ia., has let contract for the construction of a 60x140 ft. garage to cost \$30,000 and which is already under lease to Millsap Motor Car Co. The Millsap company is to install new equipment which will materally increase the investment. L. M. Millsap, proprietor is said to be the oldest auto dealer in Cedar Rapids and has moved three times to accommodate his rapidly growing business. He is Packard and Hupmobile representative.

The Cleveland Windshield Manufacturing Co. has purchased all physical assets of the Bruening

Windshield Co. and will expand its operations considerably when it takes possession of its new plant. At present it is located at 9101 Detroit avenue. H. A. Middleton, president of the Ohio Body Co., also is president of the Clevland Windshield Manufacturing Co., with C. G. Eden vice-president, Andrea Chisholm, treasurer, and A. V. Cannon, secretary.

Youngstown Oakland Motor Co., has been incorporated with a capital of \$50,000 to do a general automobile business. Following are the incorporators: John M. Reed, Carolyn F. Damon, Beatrice D. Arnold, Mark Moore and R. R. Stephenson.

The General Motors Corp. has arranged for disposal of its block of 72,000 shares of the common stock of the Doehler Die Casting Co. This represented about a 40 per cent interest in the company. The sale is in line with the policy of the organization to relinquish holdings in subsidiaries in which the corporation does not have

Eaton Axle and Spring Co., announces the opening of an office in the General Motors Building, Detroit, for the purpose of further facilitating service to the automotive industry. E. H. Janes, W. H. Wallace and D. R. Swinton representing the bumper, spring and axle divisions will make this office their Detroit headquarters. Duplicate?—See page 6 In The Retail Field

Walter G. Mortland, president of the Studebaker Sales Co., of Pittsburgh, western Pennsylvania distributor, has sold his entire holdings in the company and has retired. His stock has been sold to Fred L. Dennis, J. Merrill Wright, G. D. Jay, Jr., W. W. Harvey, W. T. Jay and J. C. Richie. Mr. Dennis succeeds Mr. Mortland as president. He was formerly vice-president and general manager. general manager.

A special meeting of stockholders of the Continental Motors Corp. has been called for March 28 at Richmond, Va., to act upon a proposal to authorize an issue of fifteen year first mortgage sinking fund 6½ per cent gold bonds, not to exceed \$10,000,000 the payment to be secured by a mortgage or deed of trust upon the corporation's entire real property.

Moon Motor Car Company's stockholders now number approximately 3,000 compared with less than 300 a year and a half ago, according to an official statement. Two thousand of the com-pany's stockholders own Moon cars.

pany's stockholders own Moon cars.

The General Motors Corp. now has more stockholders than at any time in the history of the organization. This total, as was evidenced March 12, when dividend checks were mailed, was 70,009 in comparison with 68,063 at the end of the fourth quarter of 1923, 68,281 in the third quarter and 67,417 in the second quarter. The increase comes among the holders of common stock, which has increased from 46,587 to 48,568.

Nordyke & Marmon Company, of Indianapolis, Ind., recently completed remodeling of its main office building to provide for a model salesroom. Approximately 2,000 square feet of floor space in the rear of the main reception lobby at the Marmon factory has been devoted to the display. The private offices of the company officials surround the sales floor.

Anderson Motor Co., of Rock Hill, S. C., will at once rebuild the wood working department of the company's plant recently destroyed by fire at a loss of about \$35,000 or \$40,000, The plant will be newly equipped throughout.

MUST COMPLETE PROJECT

WASHINGTON, Mar. 18 .- The government's federal aid program, put into effect on July 11, 1916, and on which a total of \$540,000,000 has already been expended by the Federal government, must be continued until the entire project covering 192,000 miles is completed.

Such was probably the outstanding statement of Thomas H. MacDonald, Chief of the U.S. Bureau of Public Roads and one of the most important witnesses before the House Roads Committee, which has had under consideration the Dowell bill, providing \$100,000,-000 a year for the next three years to carry on the program.

Witnesses from a number of states were heard.

WORLD-FLIGHT IS APPROVED

WASHINGTON, Mar. 22.-The proposed airplane flight around the world by United States Army aviators, which is expected to mean a great deal to aeroplane engine and machine builders, was given specific approval by Congress this week when an appropriation of \$50,000 was voted for the expenses of the under-

TO USE LETTER PREFIX

PHILADELPHIA, Mar. 22.-Motor vehicle license plates, when the number 1,000,000 is passed, will carry letter prefixes. Under the plan, a different letter, beginning with "A" will be used for each 1,000,000 plates used.

Government Is Asked to Take **Decisive Action Immediately**

Investigating Committee Would Curb Overnight Price Boosts by Regulating Petroleum Industry

WASHINGTON, March 23 .- Steps to regulate the petroleum industry should be taken at once and a nation-wide campaign launched to reduce the price of gasoline. Such is the recommendation just received by the Federal Trade Commission, which was called upon by the executive committee of the National conference of attorneys general, to make an investigation.

A recommendation has also been received by President Coolidge and the Department of Justice, asking that if the present law does not give the Federal Trade Commission sufficient authority to prosecute the "gasoline trust" that it be given the needed authority by new legislation.

The committee which met in Chicago last week outlined a program of activity and has sent copies of it to congress with a request that "a special and sufficient appropriation to the Federal Trade Commission for the conduct and prosecution of the work be made."

Can Raise Prices Overnight

Reciting that "the industry seems to be under such control that prices may be raised overnight at every gasoline station in the nation," the statement demanded "that all unfair trade practices in the production, manufacture and distribution of gasoline and other petroleum products be abolished without delay."

Through the advent of 15,000,000 automobiles in the country the use of gasoline has become a necessity of life, the committee of attorneys general point out, adding in its recommendation to the President:

"We suggest that all in authority, either in the States or in the Federal government, give consideration to this question of gasoline prices and other petroleum products which are so essential to the welfare of not only the 15,000,000 automobile users of the country but to thousands of other users.

Fair Prices Due People

"Nature has supplied an abundant store of petroleum, wihch geologists inform us will provide for a long period of time. It is a natural resource. The people are entitled to its use at a reasonable price. Exorbitant and extortionate prices should not be tolerated.'

The statement sent to the Federal Trade Commission and the President was signed by eight members of the executive committee, and the recommendation sent to Congress asking that a sufficient appropriation be given the Commission to prosecute the inquiry, was signed by the 48 state attorneys general at the Chicago meeting.

d

ld

n-

of on

1e

if

to

le

e

ıt.

e

CONCERNING MEN YOU KNOW

C. A. Starr, president of J. G. Starr & Son, Decatur, Ill., Ford and Lincoln dealer, and seven of his salesmen were entertained at a luncheon in St. Louis by William V. Bailey, president of the Bailey Auto Body Co. Members of the Starr Co. sales force who attended were D. H. Fawcett, L. E. Lyon, Hugh Jones, R. C. Whelan, D. O. Askins, J. E. Gregory and J. G. Bishop.

R. M. B. Tidd, formerly Mayor of Webster Groves, Mo., will become the president of the Cleveland Motor Sales Co., recently formed to handle the Cleveland line in St. Louis. Henry Rottersmann is vice-president and W. W. Mitchell of Panama, Ill., secretary and treasurer. Quarters of the new company are at 2650-52 Locust street.

Chester I. Campbell, secretary of the Boston Automobile Dealers Association, and manager of the Boston motor shows, has formed a company in Boston called the Chester I. Campbell organization to handle industrial exhibitions, fairs, etc. In the new company are Geo. E. Lenz, Frederick E. Own, J. Wallace Bragdon and Albert C. Rau.

Herbert L. Jones, who has been in the automobile business in Creston, Ia., for nearly 20 years, one of the best known men in eastern Iowa and a leader in the field, died March 6 as result of injuries received while unloading autos from a car.

Henry B. Woodbury, for 12 years representing the Falls Rubber Co. in Chicago, and later identified with the Vogue Tire Co., has been made general manager of the Vogue Tire Co. of New York, with headquarters at 126 West Sixty Fourth street.

J. Bennett Olson, 406 Highland avenue, Rockford, Ill., has been made Winnebago and Boone Counties sales chief for the B. F. Goodrich Rubber Co. and sells through the northwestern Illinois territory which he has covered several years. He succeeds John Martin as district sales chief.

Vincent L. Miller, vice president of the Miller-Toher Auto Co., Inc., Davenport, Iowa, has resigned from the company which was recently incorporated after several years' operation as a partnership at 518 Harrison street.

Fred Rohrer of New Bedford, Mass., has been appointed sales manager of the Lincoln car sales division of the Motor Sales Co., 252 Main street, Hartford, Conn. The Motor Sales Co. opened up in Hartford three months ago with the Ford and Lincoln.

O. W. Crawshaw, who has been in charge of the General Motors Truck Co. sales in Cleveland now is manager of the company's branch factory at 4400 Superior avenue, that city.

B. G. Work, president of the B. F. Goodrich Co., sailed on the Aquitania for Europe on the same vessel that also carried H. M. Jewett, president of the Paige-Detroit Motor Car Co., and Fred Alger, a director of the Packard Motor Car Co. Before sailing Mr. Work declared his belief that there will be more stability to tire prices, with no change in the near future.

J. A. Bell has been appointed Chicago branch manager of the commercial division of the American La France Fire Engine Co., after having served in a similar capacity for the White Co., and as secretary and sales manager of the Chicago Motor Truck Co.

Albert A. Lyman, formerly chief engineer of the Velie Motors Corp.'s engine plant at Marion, Ind., is now associated with the Yellow Sleeve Valve Engine Works, Inc., East Moline, Ill.

H. R. Cobleigh, secretary of service, National Automobile Chamber of Commerce, was the principal speaker at the opening of the Newburgh, N. Y., Automobile Show. His topic was "Keeping Upkeep Down," indicating how observing a few simple details in the care of the car will prevent wear and tear, and tend to lower repair costs.

C. B. Amorous, who has been in charge of wholesale sales for Wills Sainte Claire, of New York, has been elected vice president of the corporation. The company distributes the Wills Sainte Claire throughout a wide territory in the east and maintains retail salesrooms in New York, Pittsburgh, Philadelphia, and Baltimore.

O. W. Doolittle, formerly president of Pennsylvania Motors, Inc., distributors in the Philadelphia territory of Rolls-Royce cars, has been made vice president of the Wills Sainte Claire Company of Pennsylvania, in charge of Philadelphia operations.

Frank B. Belyea, Philadelphia, associated for a long time with the Larson-Oldsmobile Co., is leaving this organization to associate himself with Charles W. Mann Motor Co., Norristown, Pa., in an executive capacity.

Pa., in an executive capacity.

Riley Davis has been appointed acting manager of the Springfield Durant Co., at Springfield, Mass., during the absence of Ward Lederer on a visit of several months to the Pacific coast.

C. R. Adams, formerly with the Packard Motor Car Co. of New York, has been appointed Rolls-Royce sales representative for Northern Connecticut, with office in Hartford.

J. E. Waters has been appointed retail sales manager of the Mississippi Valley Motor Co., St. Louis Oakland distributors. He has been with the company since last August selling cars at wholesale. E. A. Hatfield, president of the company, announced the appointment recently.

Russell M. Kelvie, assistant to General Manager N. N. Van Sicklen of Apperson Bros. Automobile Co., Kokomo, Indiana, has resigned his position to accept the management of the Minneapolis Branch of the Flint Motor Company.

G. C. Jefferson has been appointed advertising manager of the Mansfield Tire & Rubber Co., of Mansfield, O. Mr. Jefferson formerly was with the Oakland Motor Car Co. and more recently in charge of the South Bend office of Dorrance, Sullivan & Co.

George F. Haid has resigned the City Counselorship to become vice president of Victor Motors, Inc., makers of the Victor line of trucks in St. Louis, Mo.

CHANCE FOR LOWER RATES

WASHINGTON, Mar. 22.—A material reduction in ocean freight rates, can be obtained by automotive exporters under the provisions of an order just issued by the Interstate Commerce Commission which puts into effect provisions of Section 28 of the Merchant Marine act of

Under the provisions of this act a reduction in freight rates can be made when a through-export bill of lading is used and an American vessel is specified as carrier. As an illustration of the saving that automobile exporters can make by taking advantage of this provision, shipments of passenger automobiles from Detroit to United Kingdom ports, via New York in American vessels will take the through-export rate of \$2.02½ as against the rate of \$2.42 per cwt., if the shipments move in foreign vessels.

The provisions of the Marine Act become effective on May 20, 1924.

England Big Tire and Tube Customer During January

WASHINGTON, March 21.—Exports of tires and tubes from the United States during January amounted to \$1,005,404 in value, consisting of 72,426 pneumatic casings and 76,091 inner tubes. Figures compiled by the U. S. Bureau of Foreign and Domestic Commerce show that during the month, England proved to be our best customer taking a total of \$175,000 of these products, with Japan a close second, importing \$162,000 worth.

The January exports of tires and tubes went to 85 countries and averaged approximately 15 per cent over the exports for similar commodities in January, 1923.

SET STAGE FOR GOTHAM SHOW

NEW YORK, March 22.—Twenty-four exhibitors of electric trucks, batteries and accessories will be represented during New York's Electric Truck week, which opens Saturday, April 19.

Much Building in South By Automotive Industry

Report Motor Concerns Doing More Construction Than Ever Before in Dixie's History

ATLANTA, Ga., March 23.—Some idea of the immense amount of new construction being carried out this year by the automobile industry in the southern states is shown in the number of such projects that were announced the first ten days of March, the most important of which include the following:

Ungar-Buick Co., Miami, Fla., a \$100,000 sales building and service station; Fred Smith, of Collins, Miss., a garage building; the Anderson Motor Co., of Rock Hill, S. C., a \$40,000 woodworking plant; Smith Brothers, of Crockett, Tex., a \$15,000 automobile building; B. H. Dunn, of Fort Worth, Tex., a new garage; J. T. Lott, of Navasota, Tex., a \$30,000 motor bus terminal; S. L. Jeffers, of San Antonio, Tex., an \$85,000 garage; C. D. Challner, of Taylor, Tex., a \$20,000 garage; Henry Thompson, Raleigh St., Bluefield, W. Va., a \$50,000 garage; the Baton Rouge Rubber Manufacturing Co., Baton Rouge, La., formed to construct a new tire plant there; the Mercer Garage Co., of Bluefield, W. Va., a four story garage building at Scott and Stewart St.; the Glen-Park Motor Co., of Glenwood, W. Va., a \$25,000 sales building and service station; the Motor Car & Truck Co., of Huntington, W. Va., a \$125,000 sales building and service station; D. E. Connolly, of Huntington, W. Va., a \$50,000 sales building and service station.

The first ten days of the month are no exception to the rule, as the automotive industry in the South is doing more new construction this year than ever before. Total investment of above projects is in excess of half a million dollars, and at the present rate there is an average of about \$1,000,000 being invested in such construction in the various southern states each month.

AGAIN—BLAME PRICE CUTTING

NEW YORK, March 17.—Like the United States Rubber Co. and the Kelly-Springfield Tire Co., the Lee Rubber & Tire Corp. suffered financially through the price cutting on tires last year. After having a most satisfactory first six months in which satisfactory profits were shown, there was a falling off in the last half, with the result that the company finished the year with a net loss of \$71,813, compared with a profit of \$370,-493 in 1922. This, too, notwithstanding the fact that net sales in 1923 totaled \$9,390,397, against \$6,468,208 in 1922.

The company paid \$256,399 in dividends, which, coupled with the net loss of \$71,813, created a deficit of \$328,716 as compared with a surplus of \$70,493 the year before.

The company's annual report includes the Republic Rubber Co., which it purchased last year, from June 9 to Dec. 31. Its balance sheet shows assets of \$15,-361,504, against \$5,612,907 the year before, and includes \$1,075,651 cash, \$1,724,520 accounts receivable, \$154,131 in trade acceptances, \$42,228 in notes receivable and \$4,567,687 in inventories.

IN THE RETAIL FIELD

The following have been appointed as new Auburn dealers: F. W. Ryan, Waltersburg, Pa.; Goetter Motor Car Co., 4730 N. Broad street, Philadelphia, Pa.; Valley Auto Service Co., New Kensington, Pa.; Overland Jamestown Co., 114 W. 4th street, Jamestown, N. Y., and Page & Gresser, 505 North Mill street, Massillon, O.

Gresser, 505 North Mill street, Massillon, O.

The Quincy (Ill.) Automobile Trades Association, suspended its rules recently to reelect Arthur P. Nesta, president of the association by unanimous vote, at its annual meeting. C. Lawrence Wells was elected treasurer and divisional vice-presidents are to be chosen at the meeting March 25. Final plans for "courtesy week" which will be made an auto show event, were discussed.

Completion of the new plant of the White Co., under construction in North Knoxville, Tenn., has been announced, and the company has moved its quarters into the new plant, which provides larger

The Gould Motor Co., of Asheville, N. C., announces its recent removal into the company's new sales building and service station at Bitmore avenue and Swannanoa drive. The company handles the Marmon line.

pany handles the Marmon line.

The Hanna Garage Co., 947 Chester avenue, Cleveland, O., has been chartered to operate a garage and sell used autos. Incorporators are Lester C. Klein, T. S. Dunlap, Samuel A. Levin, A. D. Mulligan and Martha J. Sperber.

The Bowman Motor Car Co., Hartford, Conn. until recently distributor of Willys-Knight and Overland has been appointed city dealer of Paige and Jewett with selling rights in the metropolitan district under F. W. Williams, Inc., Paige and Jewett distributors.

Fulton. Mo. automobile dealers at a marting in

Jewett distributors.

Fulton, Mo. automobile dealers at a meeting in the office of G. A. Abbott, secretary of the Chamber of Commerce, at Popular Bluff, Mo., formed an automobile club. Fourteen dealers and agents will be members. O. O. O'Dell, of the Modern Motor Car Company was elected president, and G. A. Abbott, secretary. The executive Committee is Perl Mangold, Mrs. Willie P. Barnett and John H. Patterson.

A branch devoted exclusively to the sales of used cars has been opened by the Weber Motor Car Co., St. Louis Hupmobile distributor at 3118 Locust street. This is the second outlying branch opened by the company, the first being located at 5000 Gravois avenue. C. D. Robinson is in charge.

located at 5000 Gravois avenue. C. D. Robinson is in charge.

The second annual auto show of the Auto Dealers' Association of Meadville, Pa., opened in the State armory, March 5. Lack of room was overcome by each dealer exhibiting but one model. Details of the show were handled by a committee of three members of which A. D. Barr was chairman.

was chairman.

Niagara Falls automobile dealers are well satisfied with results of their recent annual auto show.

Twenty exhibits of cars and 15 displays of accessories comprised the exhibition.

sories comprised the exhibition.

Nearly a hundred sales and service representatives of the L. & H. Motor Co., attended the annual spring season conference at the Hotel Bond Annex. Major Thomas W. Campbell, president of the L. & H. Motor Co., a fast growing organization in the distribution of the Hupmobile presided. Fred B. Sides, assistant factory sales manager, gave a talk on the Hupp situation and spoke optimistically of the outlook for 1924

Apperson Bross Automability of Theorem 1924

Apperson Bros. Automobile Co., Kokomo, Indiana, announce new dealer connections as follows:

I. W. Dillon, South Lawrence, Mass.; J. H. Francis & Sons, Morris, Ill.; F. M. Edwards, Kanakee, Ill.; Jencks-Adams Co., Attleboro, Mass., and the South Side Garage, South Glens Falls, N. Y.

Among new Auburn distributors are the following: MacDonald & Co., Frieburg-Baden, Germany, and Michael & Nordeman, Kugegatan 28, Stockholm, Sweden.

A. A., the oldest motor club in New Eng-

land, voted to change its name to the

Boston Motor Club. It will now go out

to build up the organization on the same

lines as the Buffalo and the Cleveland

clubs to make it a really big association.

Many motorists visiting Boston affiliated

with A. A. A. clubs come to the city and

are unable to find the motor club because

it is not designated with a Boston prefix.

Pacific Coast distributors of the Buick, who have recently completed a huge model sales and service station here, are breaking ground for a similar project in Oakland. The new plant will be two stories high, with working floor space of more than 50,000 square feet.

A series of addresses on sales topics by prominent St. Louisians is being arranged by Horace J. Smith, vice-president of the Southwest Nash Co., St. Louis Nash distributors for the weekly sales meetings of Nash salesmen in St. Louis. The Sanders' garage, Springfield, Ill., has been appointed Moon car distributor in Springfield and Sangamon County. E. R. Sanders is head of the

H. E. Holman and C. B. Magnuson have purchased the Mariman-Overland Co. Burlington, Iowa, renamed it the Overland-Knight Co. and reopened for business March 10.

Wheeler & Conrad have opened an auto sales room and garage at Wood and South Main streets, Decatur, Ill., handling the Star, Durant and Velie cars and the Indiana trucks.

A. R. Snook, 1015 South street, Burlington, Iowa, has taken the Rollin car agency for this territory, branching into the sales agency from his garage business.

Harry R. Johnson has become a partner of C. B. Hulin in the automobile business and garage at Cambridge, Ill. They handle the Dodge car, and a complete line of accessories.

car, and a complete line of accessories.

Frank Hitchcock of Trivoli, Ill., has purchased the Claude Craver garage in Elmwood, Ill., and has assumed possession. Mr. Craver had established a Ford agency there that was one of the largest in that section of the state.

Ungar-Buick Co., of Miami, Fla., has awarded contract for construction of a new two story sales building and service station at N. E. Second avenue and Thirteenth street. The new plant will represent an investment of about \$100,000.

The recent purchase of the East Nashville Buick Co., of East Nashville, Tenn., by the Stumb-Cawthon Motor Co., of Nashville, has been announced. The East Nashville business has been combined with that of the Stumb-Cawthon company at 210 Woodland street.

thon company at 210 Woodland street.

The Ivey Motor Co., a new Ford dealer in Atlanta, has purchased the interests of David T. Bussey, who was a Ford dealer in Atlanta for several years, and one of the first Ford dealers in the Southeast. Mr. Bussey has taken on exclusive Ford contract at Griffin, Ga.

L. E. Sheldon has been appointed manager of the White Co.'s new branch in Springfield, Mass., from which trucks will be distributed for Western Massachusetts and Vermont territory. Mr. Sheldon was previously with the Norcoss-Cameron Co. of Springfield, for 17 years, most of the time in charge of truck sales.

The Shaw Motor Co. has been appointed as

The Shaw Motor Co. has been appointed as Packard dealer in Northhampton, Mass., and surrounding territory. Harold E. Shaw, manager, announces that the company will at once build a new show and sales building. The company will continue to handle the Chrysler, Chalmers and Maxwell.

New automobile agencies formed recently in the South include the following: Gilley Motor Co., Maiden, N. C., \$50,000; Crocket Automobile Co., Crocket, Tex., \$15,000; Edgewood Automobile Co., Edgewood, Tex., \$12,000; Rocky Mount Motor Co., Inc., Rocky Mount, Va., \$25,000.

\$25,000.

Walter G. Mortland, president of the Stude-baker Sales Co., of Pittsburgh, western Pennsylvania distributors, has sold his holdings in the company and retired. The stock was brought by W. T. Jay and J. C. Ritchie. Mr. Dennis succeeds Mr. Mortland as president. He was formerly vice-president and general manager. Each of the others interested in the purchase will have official connection with the company.

CLUB VOTES FOR NEW NAME MIXING GAS WITH MOONSHINE BOSTON, March 23.-The Bay State

HARTFORD, March 22.-Arrests of motor vehicle operators in the state of Connecticut for drunkenness increased more than 74 per cent in 1923 as compared with 1922. This is evident from court abstracts received by the state motor vehicle department. Arrests for reckless driving incerased over 70 per cent in the same period. Nearly half the arrests made under the motor vehicle law were for drunkenness while driving.

Pierce Arrow Plans Sale Of Moderately Priced Car

Company Makes Important Announcement Concerning Move for Early Invasion of New Field

BUFFALO, March 22.-The Pierce Arrow Motor Car Co. has entered upon a program of expansion which includes the production of a moderately priced passenger car built to present Pierce Arrow standards of quality. Announcement of the company's plans were made by President Myron E. Forbes, at a meeting of the Pierce Arrow distributing and dealer organization at the factory in Buffalo.

In invading the field which the new moderately priced car will serve, the Pierce Arrow company is making a move of signal importance in the automobile industry for the new car will reach a market which hitherto has not been satisfied by any manufacturer.

"For the first time in automotive history," said President Forbes, "the public will be offered a moderately priced car of exquisite refinement, designed and built by men whose training and experience have been devoted solely to the production of quality motor cars.

"The Pierce Arrow company is peculiarly well situated to launch its plans for expansion at this time, for its present products, the big passenger car, the motor truck and the motor bus, have never enjoyed a greater demand. The company of course will continue to build its present products which have been so successful in their respective fields."

The new and smaller Pierce Arrow will be introduced in mid-summer. Executives of the company said today they are not prepared to say now at what price the new car will sell. They said they will not know until certain experiments have been completed.

BIG SPACE RESERVATION

NEW YORK, Mar. 21.-Over half the available space at the National Automotive Service Convention and Automotive Maintenance Equipment Show has been spoken for by manufacturers of shop equipment and tools. This event, to be held in Detroit May 19 to 23 is under the auspices of the National Automobile Chamber of Commerce and indications point to an attendance well over 2500.

The show arrangements are being taken care of by S. A. Miles, Show Manager of the N. A. C. C., and the sessions of the convention will be directed by the N. A. C. C. Service Committee headed by F. A. Bonham, service manager of Durant Motors, Inc. Admission to the show and convention will be by invitation only and invitations will be sent to factory and field service managers, engineers, distributors, dealers, shop superintendents, garagemen and independent repairmen

Burlin

Bethle

Marc

Calun

Chica

Golds

New

Mite

New

Okl

Sac

COMING MOTOR EVENTS

AUTOMOBILE	SHOWS	Terre Haute, IndFeb. 25-March	 Terre Haute Automobile Dealers' Association, A. E. Kress, Secretary-Treasurer.
		9.104	Section of August
Bethlehem, PaMarch 23-29L	ehigh Valley Automobile Show.		
		Toronto, OntAvg. 23-Sept.	ment Association and the Auto-
Burlington, VtApril 2-5E	than Allen Club, Thomas W. arkhill, Chairman.		motive Industries of Canada, Gib Robertson, Secretary.
		Washington Hgts., N. YMarch 26-31 .	
Calumet, MichAprilS	entral Storage Co., Jos. A. avini, Manager.		Dealers' Association, H. G. Stiles, Manager.
Chicago Jan. 24-31, 1925 N	ational Automobile Chamber f Commerce.	FOREIGN	SHOWS
		London, Eng.	
Goldsboro, N. CApril 21-26	Chamber of Commerce, W. C.		
n .	enmark, Manager.		
Great Falls, MontMarch	fontana Automobile Distribu-	CONVEN	TIONS
t	ors' Association, Lyman E.		
		Albuquerque, N. MMay 26-31	U. S. Good Roads Exhibition.
		Galesburg, IllMarch 31	Annual Convention of the Illia
	f Commerce, W. F. Kerwin,	Galesburg, III	nois Automotive Trade Associa-
, and a second	fanager.		tion.
	Association, Fall Show, Bart L.	RAC	ES
	Ruddle, Manager.		The state of the s
the state of the s		Altoona, PaJune 14	Event. Speedway
Mitchell, S. DApril 17-19	At the Corn Palace, directed by P. M. Young.		
		Fresno, CalApril 24	Event. Speedway
New OrleansMarch 31-April 4S	Spring meeting of the Automo-		*
	ive Equipment Association.	Frisco, CalOct. 4	Event. Speedway
New York	National Automobile Chamber of Commerce.	IndianapolisMay 30	Event.
		Kansas CityJuly 4	A. A. A. 250-Mile Speedway
	ers' Association, E. T. Bell, Sec-		Event.
	etary.	Kansas CityOct. 19	Event. Speedway
			Diene.
Reno, NevJune 14-21	Annual State Exposition under	- 10 DT	
	auspices of Reno Motor Car Dealers' Assn.	Los AngelesNov. 24	Event. Speedway
Sacramento, CalSept. 1-10	State Agricultural Society, C. E.	Syracuse, N. YSept. 1	A. A. 100-Mile Speedway Event.

The READERS CLEARING HOUSE

Questions & Answers on Dealers Problems

High Compression Needs Plugs With Short Center Electrodes

Q—I am having considerable trouble with Lincoln motors back-firing into the carbureter. It only happens when the car is pulling hard in high or following sudden acceleration which leaves the motor turning over slow with open throttle. We find most of the trouble on the old Leland built Lincoln which has a little higher compression than the new one. Now by changing the two high tension wires from the coils that feed the distributer we usually stop the popping into the carbureter and sometimes it only stops part of it, then by changing all the spark plug wires it stops the back firing and is absolutely O. K.

Sometimes the high tension wires from the coils short on a hard pull but just short into the conduit and cuts out a block or sometimes both. It seems to me that the back firing is caused by the compression becoming so high that the juice can't jump the spark plug gap under such high compression and that it just jumps through the wires into another and sparks into a cylinder with an open intake valve, but I can't see why it won't short into the conduit instead of into another wire.

By examining the wires taken out of a back firing motor some of them show very plain where the current has been jumping through and some do not show any sight of a puncture. Can you explain to me what my trouble is and just what is taking place when it is firing into the carbureter? Is there any way to make a test to find out which wires are shorted or which blocks the trouble is in without changing all the wires. I have changed every wire on one Lincoln with that trouble and it did not stop it. I closed all the spark plugs gaps from .030 to .020 which cured the trouble. What was wrong with this car? All the carbureters on these cars were O. K. Valve timing was checked and O. K. Proper gaps and breaker points and was synchronized. Spark plug gaps were checked at .020.

Now then I am fighting this trouble on

Now then I am fighting this trouble on one car I can't stop. I have checked everything as I have explained and cannot cure it. I changed wires twice but it didn't help. I also changed carbureters once to be sure all adjustments were O. K. After grinding the valves in this car it made the compression better and it backfires worse. Any information will sure be appreciated. The Lincoln service men are unable to furnish us with this information.—Sam Shankle, 1095 Elm Ave., Long Beach, Calif.

It is probable that the engine is subject to detonation or a form of pre-ignition. We would suggest that you install a set of aviation type spark plugs and set the plug gaps at about twenty to twenty-two thousandths. It is apparent that the spark plugs become overheated and ignite the charge at a time when the piston is not on the firing stroke upper center.

Be sure and install the highest grade of plugs in this engine and plugs with a minimum amount of metal exposed to the

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

combustion chamber. In other words use plugs with very short center electrode, that is with very small amount of the metal extending from the end of the porcelain.

When you have done that and have checked the ignition coil for strength of spark it should eliminate the trouble. We would appreciate however, hearing from you as to the success of the suggestion given in this answer.

FACTORY DIDN'T MARK THESE

Q—Advise where the motor number can be found on a model 90, 1918 Overland.— Theodore Luce, R. F. D. No. 2, Meshoppem, Penn.

Motor numbers are not stamped on the model 90 motor. The motor number and the serial number are the same on this model and will be found on a plate under the front seat cushion or on the heel panel under the front seat. The number will also be found stamped on the right front spring hanger or front end of the right side rail except that in the later cars of this model the number was stamped on a plate located on the right rear end of the frame instead of being stamped on the front end.

Dort Date of Nativity and Chevrolet Oil Consumption

1—I have application for insurance on a Dort Touring Car, engine No. K 71984, Serial number 16985 M. I have inquired everywhere possible and have failed to find what year this car was built. If you can furnish me with this information please answer at once for I am holding policy.

1—According to the records in our office the car bearing serial number mentioned was manufactured in 1917.

2—I would like to know why my Chevrolet 490 Sedan will only go 200 miles on fresh oil. I have used nothing but Quaker State and Mobile Oil. This car has only run 14,000 miles. Would it help to keep up my pump pressure if I cut down the size of my oil feed pipe?

I have also had quite a lot of trouble with my center main bearing. I have had it replaced three different times in 2 months and the last time I had my motor pulled and center main bearing taken out and had center casting drilled same as 1 and 3 to make center splash oil system as well as pressure and it has overcome all my trouble. If this information is of any value to you you may publish it, also my name and address.

2—We do not thoroughly understand your second question regarding a mileage of 200 miles. It is difficult to ascertain whether you mean the car goes 200 miles on a quart of oil or a gallon of oil, or whether it requires that the oil be changed every 200 miles. If the engine has gone 14,000 miles it is very probable that new rings will cut down the oil consumption considerably. If the bearings, especially, the center main and the front and rear main bearings are properly fitted there should be no necessity for reducing the size of the oil feed pipe.

My

gani

sire

kind

I

lots, relat

Sa

Re

Pa

To

Ba

Oi

cars.

Be

Us

St

Ga

a sk for More of the

busi

four

We do not approve of your method of eliminating the center main bearing trouble, and if you are encountering trouble with low pressure on the gage it may be traced to the fact that you are losing the oil through the center main bearing. If the hole drilled in the center main bearing casting is of any size, larger than .010 it will allow the oil to escape and consequently there will be no reading—or very low reading on the pressure gage. Instead of making such a major revision in the engine you should have had it taken care of by a competent Chevrolet Service Station.

3—I would like to know if there is any four cylinder motor that fires 1-4 and so on, if so, what make?—Hubert Schmitz, 617 S. Park St., Streator, Ill.

To our knowledge there is no four cylinder engine that has a firing order of 1-4 etc.

n

g

-

le

d

at

11

13

ıd

e-

00

il.

ne

le

n-

8.

nt

ly

or

of

ng

it

in

er

e.

to

no

he

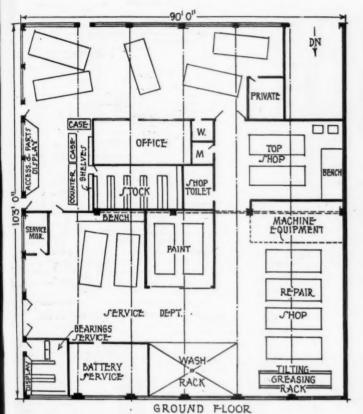
ch

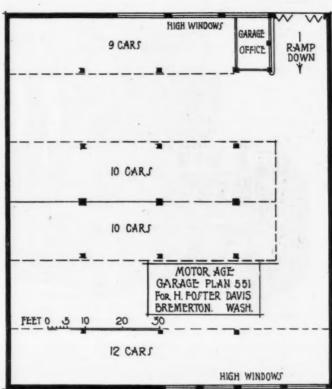
ou

tz.

71-

Business Investigation Is a Good Foundation for the Success of Any Garage





BASEMENT

-I am interested in building, or having built, for my use, according to my plans and specifications, a building in the town of Bremerton, Washington, for an automobile sales and service station.

My canvass of the situation has proven to me that Bremerton wants, needs, can afford and will support substantially a live, going concern which has a good or-ganization with sufficient capital. My de-My desire and intention is to give them the kind of a store they need and can afford in the form of an automobile department

I am enclosing a pencil sketch of three lots, giving their dimensions, also their relations to the streets and alleys. It is requested that you work out a plan for a building, considering the following departments:

Sales room, five or six cars.

Service shop for cars, quick.

Repair or reconditioning shop three to

Paint shop, two cars.

Top shop, two cars.

Battery service.

Wash rack.

Oiling rack.

Accessories, complete line, but stock not

Spare parts, stockroom, two makes of

Bearing service (rental space about 12x16-other parties)

Used car department.

Storage, 40 to 60 cars.

Gas and oil, drive in feature at corner

The three lots of which I have enclosed a sketch are absolutely the best in town for this business, considering everything. More cars pass this corner at all times of the day than any other corner in town except one corner in the center of the business district, which is only two blocks away, but the property on this corner is too expensive for the business under con-

sideration. I do not own the lots under consideration. I do not own the lots under consideration, but they can be purchased reasonably. In sketching a building you will consider the following questions:

It is my desire to build of either concrete, concrete block or tile. Wood or steel trusses may be used. To get a good substantial and conspicuous building and still keep the cost down as low as pos-sible.—R. Foster Davis, Lieut. U. S. N., Puget Sound, Wash.

We are very sorry to have been so slow in answering your letter but we have been so upset about shows and special issues for the last month that we have not known whether we were "afoot or horseback."

Rather than keep you waiting longer, however, we are enclosing a pencil layout instead of taking the usual time to get a blue-print after having the drawing made in ink. We believe that it would be almost impossible to include the numerous departments and the amount of storage that you want unless you get the whole three lots, and we also think that the two-story plan would be better.

We have taken for granted that the grade in the street is down towards the east and have arranged to take advantage of the drop in making a ramp to the basement floor. We have not, however, taken advantage of the alley as it is too narrow to be of any great benefit, and being on a grade the same as the street, would require another ramp to make it available.

There is not much that we can say about this plan that is not apparent, the accessory department, of course, is on the main street, as is also the service entrance. This divorcing of the service entrance and the garage entrance, we believe, is a very good plan. There is a quick service department just inside of the main entrance while the main repair shop is at the rear.

The only thing we have been obliged to slight is the Used Car Department. This we think would best be taken care of in the basement garage, using the section nearest the entrance for the cars. Here you have some light through the high windows along the side made possible by the pitch in the street. If this idea is carried out, it would be necessary to have a stairway leading from the show room down to the Used Car Department, and this might be installed in the space we have shown as the Garage Office.

Architectural Service

I N giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

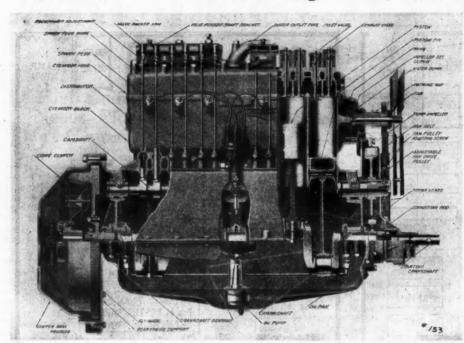
Rough pencil sketch showing size and shape of plot and its relation to streets and alleys. What departments are to be operated and how large it is expected to be.

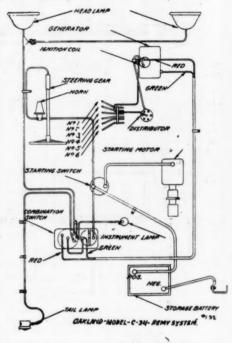
Number of cars on the sales floor. Number of cars it is expected to garage.

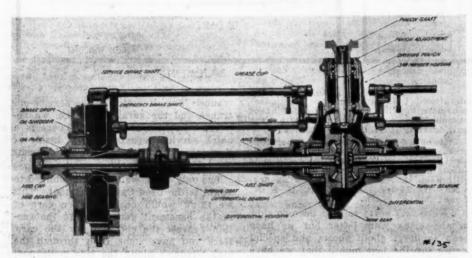
Number of men employed in repair shop.

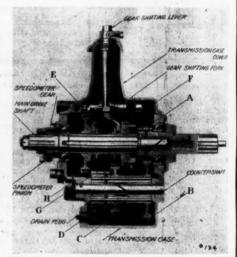
How much of an accessory department is anticipated.

Oakland Wiring, Clutch, Motor and Axle









fo war cr sa so ar

sh

on

dr

be

for

the

an

the

th

sh

res

er

on

tac

sh

thi

110

Q—Print wiring diagram and motor, clutch, transmission and rear axle cuts of Oakland roadster model 34 C frame number 13727034. Also give valve timing and other information available on this car.—Snipes' Garage, Tyro, Miss.

The wiring diagram is shown at figure 132. Illustration, semi cut-away of the engine and clutch is shown at figure 133. The transmission is illustrated at figure 134 and the rear axle at 135.

The timing is as follows: The exhaust valve closes 7½ degrees past upper dead center. The inlet opens 17½ degrees after upper dead center. As an example of timing, time inlet valves on cylinder 1 and 6 with mark U. D. C. one and six on top, turn flywheel 17½ degrees or 23/32 in. to mark I. O. one and six. When inlet valve of cylinder one or six should open. Continue to turn flywheel 200 degrees to mark (I. C. inlet close) one and

six when inlet valve of cylinder one or six should close. There should be a clearance of .008 between valve rocker arms and the valve stem indicating that the valves are seated and tight.

In order that you may not get mixed up with the flywheel marks you may time the engine on piston travel by setting the exhaust valve to close 1/32 in past upper dead center measured on piston travel.

FIXING BUICK PEDALS FOR CRIPPLE

Q—As a reader of your publication I have a problem that I want to put up to you for suggestion and help. I have just sold a new Buick six cylinder 1924 Roadster, Buick model 44 to a young man who is minus his legs and I want to design the most practical method of rigging up the clutch and brake pedals with levers so that he can operate with his hands, these two factors in driving. He desires an arrangement by which he can push in or down the brake and clutch pedals. As the car has just been sold and the buyer is anxious to operate as soon as possible I would appreciate very much your

prompt reply to this letter-P. H. Van Dyke, Newport, Ark.

The enclosed tracing we believe will give you a good general idea of the most popular method and perhaps the least expensive of converting the conventional control into a hand control. The tracings were taken from an installation on the Ford car but can be applied of course, to sliding gear control mechanism. It is advisable that the brake pedals be so adjusted that it will have about ¾ to 1 inch movement before the brakes start to take hold.

In other words adjust the brake rod so that the brake pedal may move the distance mentioned before the brakes become effective. With this done it will enable you to interconnect the brake pedal with the clutch so that when the brake operating rod is moved forward it will automatically release the clutch.

A hook or arm connected to the brake pedal with one end of it just behind the pedal will enable movement of the clutch independent of the brake and at the same time will give automatic action when the brake rod is actuated.

4

e or

cker

that

ixed

may

set-

2 in.

OTI

the

s be-

will

rake

1 the

rd it

the

be-

ment

rake

natic

ed.

Shop Power Plant Circuits With Low Current Cutout

Q.—We have noticed an article on page 95 of the January 24th, 1924, issue of Moror Age in regard to a shop lighting plant. We have been figuring on the same proposition and intend to use a Chevrolet engine as a source of power. We intend to install a set of Delco batteries, with 58 cells in the set which would give us 116 volts. The battery would be used during the day for drop lights and hand drill. The engine would be used to keep the battery charged and in case a heavy load was desired from the batteries.

As we understand it there would need to be some kind of a cutout to disconnect the generator from the battery in case the engine should fail. If this is the case give name of maker and approximate price.

We also intend to use this power plant for running shop machinery, such as drill press and small lathe, and also for burning in or running in Ford engines and Chevrolet engines. For the burning in stand we intend to use a complete Chevrolet frame, dismounting the springs and mounting the frame on a concrete base.

Power for shop use and for driving the generator will be taken from a pulley mounted in the frame directly in the rear of the transmission.

The electrical load for the generator will be two Chevrolet signs which each use 900 watts and about 60 other lamps each consuming 50 watts, or 3000 watts, including the signs. What size generator would be needed to handle this load and allow for a safe overload factor?

Give name of firm handling secondhand generators also give sketch showing layout and generator wirings. Give name of concern that can supply the devices we may need.

This brings up another question whether, if we use the one power plant for all purposes, the friction of pulleys and shaftings may make quite a difference in the engine load.

We could use one Chevrolet power plant for generator purposes only in which case we could do away with the transmission and attach pulley directly to the engine crankshaft. Which would be the most satisfactory? We have half a dozen or so old Chevrolet engines around the place and could use one for each purpose. Could you give us approximately the cost per K. W. with electrical power generated in this way.

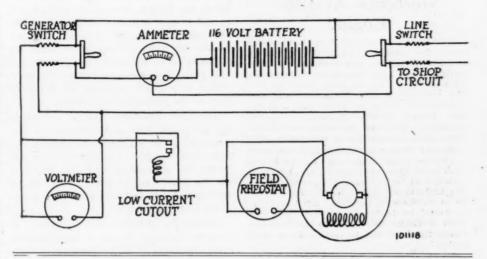
The above is quite an earful but we hope we are not overdoing the inquiry.

-Harry E. Warne, Warne Motor Company, Bedford, Va.

A.—We believe it would be advisable to use three Chevrolet motors. One should be used for driving the generator, one for the burning in stand and one for driving your line shaft. It would also be advisable to have one or two other Chevrolet motors kept in good condition for replacement purposes in case one of those in use should get out of condition.

A suggested wiring scheme is given and in this diagram it will be seen that the current from the battery will go through the ammeter in going out to the shop circuit. The generator has a field resistence connected in series with generator and a low current cutout which is also used.

This type cutout has a series winding only and it is necessary to close the contacts by hand. A five K. W. generator should be sufficient for your needs and this should generate about 50 amperes at 110 volts. The low current cutout lets 50 in case the engine or generator fails,



and the contacts will open at about 7.5 amperes.

In starting up, the left hand or generator switch could be closed to see that the voltmeter reads in the right direction and when the switch is closed it will be reading battery voltage. The switch can then be opened and the engine and generator started. The cutout can then be closed by hand and the voltmeter should then read generator voltage.

If the voltmeter should read backwards it will show that the generator is magnetized the wrong way. In this case it will be necessary to lift one of the generator brushes and when the engine stops, close the left hand or generator switch and also the cutout, so as to magnetize the field of the generator in the proper direction.

When the generator voltage is from 125 to 140 both the generator switch and the low current cutout may be closed, and the generator should then charge the battery.

One Chevrolet engine which is used for a burning in machine will probably be O. K. if the transmission is used and the low speed gear employed when burning in bearings. Referring again to the engine used to drive the generator it would be well to run it about 900 r.p.m. and run the generator at 1800, assuming it is designed for that speed.

This means that the pulley and belt drive would be used and to get the 2 to 1 ratio the pulley on the generator should be half the size of the pulley on the engine.

We have figured your lighting load at approximately 5 K. W.. One kilowatt equals 1000 watts, so that you can add up your total watts load and divide by 1000. However, your lights and signs will not be running all the time and your engine operating in the day time will make up for some of the current used at night.

Information as to sources of supply on generator and cutout will be given by separate letter.

DIFFICULTY IN THIS SCHEME PRO-POSED FOR RUNNING CAR WITHOUT BATTERY

Q—As I understand it the reason a car cannot be operated without the storage battery in the generator circuit is because the resistance of the battery acts as a regulator for the generator to keep it from burning out.

If my reasoning is correct is it not possible to use a resistance unit in the circuit where the battery belongs and operate a car just the same as if the battery was in place, provided of course the car was equipped with magneto or else dry cells used for ignition.

If this is possible could iron wire be used as a resistance unit and if so what size would you recommend and how much? What I would like to do would be to operate a Ford car with the battery removed without shorting the generator and still have lights at normal speed, but I may want to operate other cars the same way if possible.

A resistance can be used in place of the battery to use the current not required by the lights but any definite resistance is only right for a certain car speed. The battery has the faculty of absorbing anywhere from one to 20 amperes without disturbing the generator voltage to any great extent. On the other hand a resistance can only take a varying amount of current by forcing the generator voltage to change in proportion to the change in current. For this reason you would have to have a resistance which would change with every change in car speed, and of course this is out of the question. The voltage regulator type machine is the only answer to your problem of running lights directly off of the generator. This type of machine requires a vibrating regulator which is more complicated than the third brush system of regulation used on a Ford generator so that as far as your question is concerned, the answer is that it cannot

Using a Ford Engine for Stationary Work

2—What size gasoline engine can I hope to replace with a Ford engine for belt work?—Vern D. Arthur, Marble Rock, Lowa

2—For continuous usage you can get from 8 to 10 h.p. from a Ford engine.

Mai

era It be in an

in all

scr: Wo

r.p. 3%

inc

eng

be

of

ena

ens

We

tro

dia

hee fro nec

7

ass

in

lin

tin

oth

effi

Installing Flywheel on Mercedes Aviation Engine

Q—We are installing a small Mercedes 6-cylinder aviation motor $4\frac{1}{2}$ x6 in an automobile chassis and would like a little advice from your technical department. This motor is nearly new, built in 1922 and recently bought by me in Germany. It develops 120 h.p. at 1600 r.p.m. and has two Robert Bosch magnetos mounted crosswise and has Mercedes carbureter with supercharger which cuts in at 1200.

What I want advice on is this: How can I attach some American flywheel and clutch on this propeller shaft which is 2 inches at large end and tapered 1 to 10. We understand it has no flywheel flange as in automobile practice. Do you think it would be better to cut off shaft and weld a flange on so as to use conventional flywheel and 12 inch Borg & Beck clutch?

1—There are two methods of attaching the flywheel to the crankshaft. The easiest and perhaps the cheapest method would be to secure some standard American propeller hub. If the taper on the American propeller hub does not correspond to the German standard taper on the crankshaft, have it bored out in some well equipped machine shop to the approximate size.

When the taper has been bored to size, apply it on the end of the crankshaft with the key removed and carefully lap the hub to the shaft. When this is done you may draw up the nut and pull the hub tightly against the taper. Then mount the shaft in its bearings or on the centers of a lathe or Vee blocks and rotate it to determine whether or not the hub runs true.

In giving this information you will note that we have not made any mention of the method of attaching the propeller hub. It is impossible for us to give you definite instructions on this because of the fact that you have not mentioned the length of the taper nor have you outlined the method of attaching the original hub.

Assuming now that you have attached the American hub to it and have it running true in both planes, the next thing will be to prepare the flywheel for attachment to the hub.

We know of an A-7A Hall Scott four cylinder 51/4x7, installed in an automobile that is equipped with a Stearns Knight four cylinder flywheel. Before you attach the flywheel to the hub or do any machine work whatsoever on the hub. it will be necessary to turn down the fillet which will be found at the rear of the hub where the shaft part starts to ward the flange. You also will want to make sure that the propeller hub bolt holes are of a standard diameter and that the face of the hub flange is true, as previously stated. If there is any fillet or roundness or beveled edge on the flange it would be well to turn this down to a flat, square surface.

When this is done the next step is to

caliper the diameter of the propeller hub flange, then find the center on the flywheel and turn a recess into the flywheel to the proper diameter and depth to fit over the propeller hub flange. In other words, the flywheel will be centered on the outside of the propeller hub flange, and possibly a portion of it on the propeller hub shaft housing, or extended part of the propeller hub proper.

The final check-up will be to mount the propeller hub and flywheel on the crankshaft and with the shaft in its bearings, test the face and edge of the flywheel for squareness and also check it on Vee blocks for balance. This will of course necessitate removal of the crankshaft from the engine.

Regarding clutches and flywheels, it may be advisable for you to communicate with the Borg & Beck Company, Moline, Ill., as they perhaps will be in a position to inform you of the model of clutch best suited and also name and make of car carrying a flywheel with their clutch of largest capacity.

In order to transmit the unusually high torque of this engine, it will of course be necessary to use a clutch of greater capacity than the average size possess. The aviation engine installed in the chassis previously mentioned was equipped with a Hele Shaw clutch manufactured by Merchants-Evans Company, Philadelphia, Pa. It may be advisable to communicate with them in addition to the Borg & Beck Company or any of the

clutch manufacturers advertising in the columns of Motor Age.

2—The compression ratio is 5 to 1. Is this too high for commercial gas?

2—Generally speaking, a 5 to 1 compression ratio will be too high for the regular commercial gasoline. The answer is to use a blended fuel, Benzol, or a Benzol mixture. If Benzol does not reduce the tendency toward pinking it will mean reducing the compression, but we doubt whether this will be necessary.

Another suggestion is that you install some form of hot-spot to the inlet manifold. This will be necessary, especially with commercial gas, and will be a help with Benzol, because of the fact that the engine was originally designed for the use of a special Benzol or high test gasoline, which was far more volatile than the commercial type which you will encounter in your neighborhood. The addition of a hot-spot to the manifold will tend to prevent a lot of the pinking and will give general all around better running.

3—How can I get a rear axle ratio of about 2¼ to 1? Do you know of any well known axle housing that will accommodate so large a pinion? If so give me name of axle, and also state name of company who will make special gears to order of above ratio. I am building this for a fast sport roadster and not for racing, am going to put on a Schutte special four passenger body on it with wire wheels and 34x7 balloon tires with Mercedes V radiator. — William Cooke, Beaumont, Texas.

3—This will be answered by separate letter.

Adjusting Carbureter on Model 35 Haynes

Q.—Give instructions for adjusting the Rayfield carbureter used on a Haynes car, model 35. How many adjustments are required and where are they located?

1.—There are two adjustments, a low and high speed. The low speed adjustment should be turned to the right or left as required until motor runs properly at low speed. Allow motor to become thoroughly heated, then make final adjustments by turning low speed screw to the left or until motor slows down; then turn to the right a notch at a time until the motor idles smoothly. If motor does not throttle low enough, turn stop arm screw to the left until it runs at the lowest number of revolutions desired.

The high and intermediate speed adjustment is made accessible by removing the hot air elbow from over the main air valve. Do not move the high speed screw more than ½ turn at a time. Turn it to the right for a richer and to the left for a leaner mixture. This setting being very effective will greatly affect the fuel economy; therefore make sure it is set as lean as possible, still retaining good acceleration.

2.—We would like to build a burning in machine for Fords also suitable for other small engines. Would like drawing of one if possible.—A. L. Woertz, Prop., The Goodfield Garage, Goodfield, Ill.



Rayfield Model M carbureter showing adjustments

2.—We have no drawing available and enclose answer to a similar question asked by John M. Cruitt of Henderson, Kentucky. We will also give by special letter a list of concerns making machine of this sort, and we would suggest your writing to them as you may find it advisable to purchase a machine instead of making one. If you do not buy one outright you may fint it advisable to purchase the stand at least and then install an engine with a transmission and a driving unit.

e

a

11

11

i-

n

e

ie

n

1-

11

id

n-

of

n-

ne n-

m

te

nd

ion

on,

eial

ine

our

ad-

of

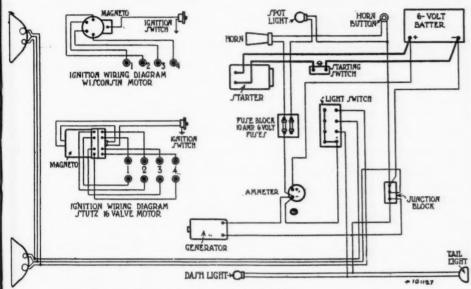
ut-

ur-

tall

l a

Stutz Series R Wiring



1917 STUTZ REMY ELECTRIC BOSCH IGNITION

Q—Supply wiring diagram for Stutz Series R car number 5398. This car has a Remy starter and generator and Bosch Magneto. Also advise the year this car was built and give the h.p. and gear ratio. This is a roadster.—E. O. Gerken, Gerken Battery Co., 3254 Glenwood Avenue, Toledo, Ohio.

The diagram is shown in accordance with your request. The car was built in 1917, the bore and stroke being 4% by 5½. This means that the h.p. was 36.10. The gear ratio was 3.06.

On Building a Dodge Into a Racer

Q—We are building an old model Dodge into a racing machine and there are several things that we are in doubt about. It is not necessary that these questions be published unless you find something in them of general interest. There was an article on the Dodge racer published in a recent issue but it did not tell us all we wanted to know. We are new subscribers and do not keep files of Motor AGE. Would it give us more h.p. at a higher r.p.m. to reduce the cylinder bore from 3% to 3½ inches, keeping the rest of the motor the same—Harold Stephenson, Milbank S. D.

If you reduce the cylinder bore to 3½ inches and do not change the rest of the engine it is doubtful whether there will be any increase in the power. Reduction of cylinder bore tends to reduce the stresses on reciprocating and rotating parts and it is for this reason that it enables lighter parts to be used. If the engine is to be used for dirt track work we would advise against the expense and trouble of reducing the cylinder bore diameter.

Q-What effect would it have on an L head motor to increase the valve diameter from 1% to 2% inches and will it be necessary to increase the size of the manifold to get the full benefit from the increased valve area?

The effect of enlarging the valves will assist, if the manifolds are large enough, in allowing a greater quantity of gasoline to reach the cylinders in the same time as would the smaller valves. In other words theoretically the volumetric efficiency of the engine has been in-

creased. If the increased area of the valve is choked off or throttled by a noticeable decrease in the diameter of the inlet manifold there will be no gain in speed, power, or efficiency. The idea for racing manifolds is to secure a great quantity of gas with the least loss due to high velocity. In other words the manifold should be small enough to allow starting easily and large enough to handle a maximum amount of fuel without any losses due to wall friction of the fuel against the manifold walls and block passages.

Q—If we use two carbureters bolted direct to the block can we use smaller carbureters than the one now used?

The idea behind more power and speed is to burn as much gas as possible and in the smallest time period. If the engine will turn fast enough to consume the fuel from two carbureters of the original size that is the size carbureter that you will want to use. In this respect we would suggest that you get in touch with any of the makers of carbureters and seek their advice as to the sizes best suited and the internal specifications recommended for racing. It is our personal opinion that the carbureters should be not less than the same diameter of the one used at the present time on the Dodge engine.

Q-What tire size would you recommend for this car, 28 by 4 or 28 by 4½? Would the Dodge rear end be too light for the 4½-inch tire?

There is little to choose between the 28 by 4 and the 28 by 4½. Theoretically the 4½-inch tire will weigh slightly more

than the 4 inch and if the car is to be used for dirt track work where light weight is a prime requisite the theoretical choice would be the 28 by 4. Regardless of the tire diameter we would suggest you use a wheel or some special method of retaining the tire on the rim in case of a blow out. A certain type of depressed rim wire wheel can be used for this or you may use a conventional rim with safety lugs which pass through the rim proper and serve to hold the tire when underinflated. If anything the Dodge rear end is slightly heavy for dirt track work providing the car is brought down to a reasonable weight, which should be not more than 1,500 lbs.

Q-What amount turned off the fly wheel will give the best getaway and pick up?

We cannot answer this question definitely as the best results will be obtained only by experiment. Off hand we would suggest that you remove not more than 12 or 15 pounds for the first trial. For maximum acceleration the fly wheel can be reduced in weight until the engine starts to become rough at speeds around 400 revolutions per minute.

Q—We intend to plane the head use a double ignition mounting, one magneto on the frame, Alumnite pistons and bring our center of gravity as low as possible and use the straight Dodge ratio. The weight will be about 1,500 lbs., and the machine will be used on half mile tracks. What speed do you think a machine of this kind will develop?

The amount of speed to be secured is dependent first on the power to weight ratio, and secondly on the method of transmitting the power which consists in the rear axle ratio and tire sizes. Unless you can get at least 70 h.p. out of the engine it will be difficult to secure enough speed to keep the car in real fast company. A power to weight ratio of not less than 16 to 1 should be the ideal toward which you should work.

Q—Give us the addresses of companies making special valves and 16 valve heads for the Dodge.

The information requested will be supplied by separate letter.

Some Dates of Interest

Q-Please give me the date of a recent article (3 or 4 months ago) on front wheel shimmy causes and correction.—W. L. Tule, 1685 Overton Place, Memphis,

We do not know what article you have reference to in regard to wobbly wheels. A short clearing article pertaining particularly to the 1923 Chevrolet was printed January 31, 1924. Another article one of the series of "Engineering for the Service Man," which had to do with steering with a short reference to wheel wobble was printed in the June 28, 1923, issue of Motor Age. A very extensive article covering wheel wobble was printed in the November 16, 1922, issue of Motor Age. If you will inform us which of these you desire we shall be in a position to supply you with an exact copy.

atir

spe

tha whe To

coil

coil

pro

whi

bv

Fig.

min

ther

of t

the

Isfa

0th

and

tion

mas

effo

t'ed

L

Bus

Ext

stat

ness

B

char

vent

ask 1.

gres

emp

dan and

cupy

Wor tices

stim

it is

How to Make and Use an Ignition Tester

Equipment that Impresses the Customer Is an Accomplice for Your Cash Register

REQUENT enquiries received by the Clearing House Dept. of Motor Age indicate that methods of testing ignition coils would be of interest. The following article published in the April 19, 1923, issue is accordingly reprinted.

For a spark gap we have shown the porcelain and center electrodes from a spark plug used as one side of the gap while the center electrode only from another spark plug is used as the grounded side of the gap. You will notice that the grounded side of the gap is mounted on a pivoted support so that the distance across the spark gap point can be varied by swinging the arm around the pivot. If connected as shown no shock will be obtained when moving this grounded support. The interrupter that we have shown on the test board can be any interrupter that is available. For example, a Connecticut, Remy, Atwater Kent, Wagner, North East, or any similar type can be used, although it would be preferable to use one that does not have a condenser built in it. If you have available an interrupter that has a condenser in it, it could be removed and used for the spare condenser as shown in the upper part of the test board.

At the left side of the test board there is shown an ammeter and a battery switch although these could be eliminated if so desired. In this case the interrupter should always be left with the points opened when it is desirable to have no current flowing.

The trick in using any ignition tester is in properly connecting the coils and as far as we know there is no ignition tester made that can be operated by a man who has no idea of ignition systems In Fig. 1 we have shown the ignition tester connected up to a Remy

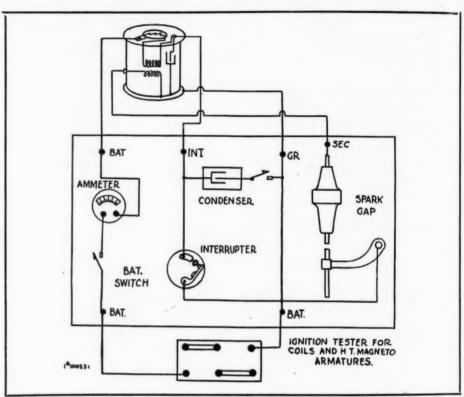


Fig. 1

coil and in this case the trick is to connect the test board terminal marked interrupter (Int.) to the common terminal which serves both the primary winding and the condenser. The other end of the primary circuit goes to the Bat. terminal on the test board while the base is connected to the Gr. terminal which serves both the condenser and the ground end of the secondary.

The live end of the secondary is then

connected to the Sec. terminal on the test board which carries the high tension spark to the spark gap. In the construction of the test board it would be possible to drive the interrupter with an electric motor or a wheel and handle could be put on so that it could be turned by hand or if high speed is desired perhaps a 1 in. pulley could be put on the interrupter shaft and 8 or 10 in. pulley belted to it so that turning the

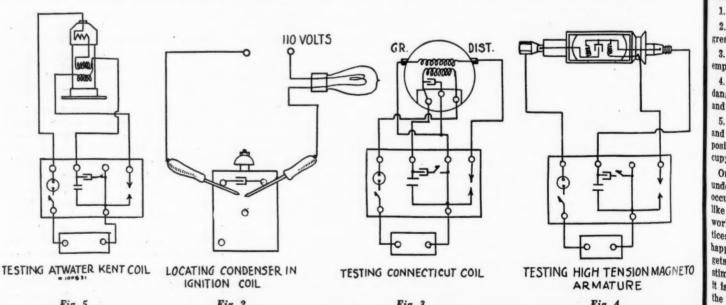


Fig. 5

Fig. 2

Fig. 3

Fig. 4

the

ion

on-

he

rith

dle

he

de-

put

10

the

NETO

large pulley gives high speed to the interrupter.

It will be found, however, that operating the interrupter at a fairly low speed will check the ignition coil better than at high speeds, as it is easier to tell whether the sparks are missing or not. To test an unknown coil the first thing to do is to find out what is inside of the coil and in Fig. 2 is shown a method of locating a condenser in an ignition coil. When the condenser is found, the proper terminals will be those through which no current will flow as indicated by the lamp failing to light. However, as the test points are kept as shown in Fig. 2 and gradually slide along the terminals, until the points touch together there will be a snappy spark at the tip of the test points which indicates that the condenser has been located. Should the condenser location be known, however, and the lamps light up through

the condenser it would prove it to be punctured and would show that a new one was required. After the condenser has been located the primary circuits should be found and this can usually be determined easily by the appearance of the coil or by the terminal which gives a good circuit as shown by the lamp lighting up. Another way to test for the primary circuit is with a 6-volt battery and an ammeter an ordinary 6-volt closed circuit coil drawing approximately 5 amperes. After the internal circuits of the coil have been figured out it will be found that there is always one common terminal which is serving both the primary circuit and the condenser, that is, when the coil includes a condenser. This terminal should always be connected to the Int. terminal on the test board. The other end of the primary circuit should go to the Bat. terminal, the live secondary should go to Sec. on the test board and the other end of secondary and condenser should go to Gr. terminal. In Fig. 3 will be seen the method of testing Conecticut coil which is based on the above principle. In Fig. 4 will be seen method of testing a hightension magneto armature. In this case it is impossible to get the condenser in the armature properly connected with respect to the interrupter on the test board so that with the condenser switch opened, fair sparks should be obtained at the spark gap and with the condenser switch closed the sparks at the test gap should be improved. When ignition coils are being tested the general rule is to leave the condenser switch open when a condenser is in a coil and close it when there is no condenser. For example, in Fig. 5 the Atwater Kent ignition coil having no condenser it is necessary to close the condenser switch to get proper results.

Finding the Right Place in Business

INDING his logical place in business is a problem which can be solved satisfactorily only by the individual himself. Others may ask questions, give advice, and help analyze all the attending circumstances, but he alone can adequately judge the situation from all angles. Every young man should choose a vocation which will hold his interest, the mastery of which will amply reward his efforts. The sooner this problem is settled the better for him.

Letters and inquiries received by the Business Research Bureau of LaSalle Extension University tend to support the statement that many workers in the business world today are in doubt whether to retain their present positions or look for others.

Before definitely deciding on such a change, every man should first take inventory of his present surroundings and ask himself the following questions:

- 1. Do I like the work?
- 2. Are the employes around me progressing satisfactorily?
- 3. Do I come in close contact with my employer?
- 4. Can I progress steadily or is there danger of stopping in some blind alley and working in a rut continually?
- 5. If I work diligently and intelligently and energetically for ten years, what position may I reasonably expect to occupy by that time?

One of the fundamental principles underlying successful application in any occupation is that the individual must like the work. When a person enjoys his work his interest in it is keen. He notices all the details concerning it. He is happiest when absorbed in his work and sets a wholesome mental and physical stimulus from all he accomplishes. Thus it is that his success is more certain in the line of work that he enjoys.

Generally speaking, a man should

never undertake work which he dislikes, unless it is merely a stepping stone for something farther on which he desires very much. In such a case he should undertake the work whether he likes it or not. When an individual is happy in what he is doing he is able not only to make his life infinitely more purposeful, but also to give without reservation, the best effort that is in him to his daily tasks.

All Are Discouraged at Times

If a man's development in his present place will gradually make him more and more valuable to his employer it is certainly well worth the effort to apply himself as industriously as possible to the job at hand, provided, of course, that all other factors are proving up satisfactorily.

No man should make the mistake of thinking, whenever he may be dissatisfied or discouraged, that his real opportunity lies elsewhere. All successful business men have been greatly discouraged at some time in their careers; nevertheless, they have persisted and later rejoiced because they did.

Before he starts looking elsewhere a man should assure himself beyond question that there is no opportunity where he is.

Whether a man is in a large or small concern makes little difference. Men may disagree as to whether the large or the small enterprise holds out the most opportunities, but there is no division of opinion that real opportunities exist in both

A decided tendency has recently developed for big businesses to decentralize their plants and divide their production work into many small plants located in various sections of the country. The plan of operating a number of smaller concerns under one central control has been found the most satisfactory method of operation in such industries as automobiles, electrical appliances, shoes, clothing, packing, and the like. In such or-

ganizations may of the advantages of both a large and a small concern have been combined.

In a large concern one has the opportunity of advancing to a high executive position. In a small concern one may enter into partnership and become part owner or step into a bigger organization. A small organization offers a man excellent opportunities to prepare himself for higher responsibilities in a larger organization because in the small organization he is able to develop many different abilities: see all phases of business operation and develop unusual initiative. If the occusion ever arises when he is called upon to specialize on any particular phase of business, he is well equipped to do so.

Opportunity never depends on the size of the enterprise—always on the individual himself.

There are two other look-out points from which one can survey his present position. One is from the angle of preparing to go into business for himself. If he keeps his present position, will he be able to save money and at the same time acquire a fund of knowledge which later will enable him to go into business for himself? If the answer to this question is "yes," then no doubt he will do well to stay where he is, provided he cares to take the risk and likes responsibility enough to enter business for himself.

The second point of view is that of getting a share in the enterprise. Is there any possibility that the employer will reward his efforts and loyalty, by tendering him an interest in the business? It may not often happen, but whenever it does, such a possibility is well worth considering.

There is opportunity enough everywhere, no man need make the mistake of thinking that in order to succeed he must change his position in order to find real opportunity. It often happens that when things look darkest opportunity lies just around the corner.

QUEEKS 8



Whether the world owes you a living or not can best be decided by trying to collect it on the fact that you can eat and sleep well.

Trying to make the best of it with a lot of people consists of telling others what good losers they are.

Not Much

There isn't much to selling, There isn't much to do There isn't much to anything, It's simply up to you.

—T. R.

Both Cost Money

Many a man lets rust gather on his brain who wouldn't dream of letting it gather on the radiator of his car.—"Forbes Maga-

She—(when car jolts over rough road)—"Terribly rough, isn't it, dear?"
He—"It shouldn't be, dearie. I shaved this evening."—"Dentantics."

Forehanded

"How did Rubinsky make his money so quickly?"
"Why, he established branch junk shops close to all the important grade crossings of the country."—"Detroit Free Press."

"I don't understand men." "What's the matter now?"

"My husband ran a tank during the war—and now he can't even run a vacuum cleaner for me!"—"Tatler."

All Right-Why?

Why doesn't the spider of the steering wheel eat some of the flies on the flywheel?

No Need for Worry

Nervous Customer (asked to leave his keys in the car):
"Are cars stolen from this shop often?"
Surly Mechanic: "No, only once."
—HAP.

One or Two of the Things That Make Life Worth Living

There are certain dates we would hate to forget f'r'instance the opening ball game—the Elk's picnic and the day the hunting season opens. There are other dates we better not forget such as the wife's birthday and others we can't forget although we would like to. We are coming to some now. The dates our we would like to. We are coming to some now. The dates floor plan notes come due—we should have a lot of money.

The man from the factory told us so and he ought to know. Wonder what's wrong. He told us to buy a lot of cars because the factory would be 'way behind in the spring and there would be a line of people reaching from here to there all with their

hands full of jack waiting for cars. Anyway, cars were going up, that is, if they didn't come down.

He explained to us how easy we could get rich—20% on a \$1,000 car is 200 smackers—100 cars \$20,000 iron men. A blind man could see that with one hand tied behind him. Of course, there are a few small expenses such as 10% overhead, 5% salesman's commission, 3% storage charges—2% interest, 1% depreciation and that leaves for net profit—Oh thunder I never was any good at figgers. Let's talk about something else—Every other dealer in town has a lot of cars and they seem real anxious to move them. They must have notes coming

They are bidding real high prices for used cars I have to pay more than I want to get them but I am not going to let them other dudes get all the business and besides I have got to meet them darned notes I want to show the factory I am a live wire. I don't want them to give my contract to some one else. The factory can get lots of dealers—the man told me so. He said the janitor has to kick them off the office steps so he can get in to open up in the morning.

I pretty near break even on my used cars anyway.

I sold one this morning that I only lost \$45.00 on and my net profit will take care of that. A man must expect some expense running a business like this. Our bookkeeper says what the hod owe care for expenses, we've got lots of 'em. Anyway I expect this will be a good year. I don't think we will lose as much money as we did last year. A fellow told me that he thought Barnum was mistaken about one being born every minute—he says they must be twins. I don't know what he meant by that Wonder if he was kidding me. Anyhow we will make a lot of money in June if we can get cars—Please tell me if you can what is wrong—Why can't I make a lot of money like the factory man said I could? He says all the other Scatter Bolt Six dealers are making barrels of jack.

A lot of them went broke last year but then they must of lost their money playing poker or something. Well I must close as I am going out to see if I can trade for a 1910 Obsolete. I think I can get it for \$400 I hate to do it but the dealer around the corner offered him \$375 and it is better to have \$300 tied up than \$700 and may be I can sell it in the spring and not lose much. And so it goes.

A DEALER.

Fable

Once there was a salesman Who knew the car he sold; And he would never take in trade A "wagon" that was old.

TIM-KEN.



ing

n a A Of ad, est, er l else em ing

em leet ire. The get

net

nse h--ex-uch

ght
-he
hat.
of
can
facSix

lost as ink the

up ose

Current Motor Truck Specifications (This list comprises trucks distributed on a national basis)

	4		ENG	INE		re .	REAR /	XLE	TI	RES		ty.		ENG	INE		9	REAR	AXLE	TII	RES
MAKE AND MODEL	Tons Capacity	Price	Make and Model	Bore and Strekes	Clutch Make	Gearset Make	Make and Model	Final Drive	Front	Rear	MAKE AND MODEL	Tons Capacity	Price	Make and	Bore and Strokes	Clutch Make	Gearset Make	Make and Model	Final Drive	Frent	Rear
	1-11/2 11/2-2 21/2-3 31/41/5-61/4 21/2 31/2 5-61/4	\$3950 4950 5500 2550 3150 3150	Co-N Co-J4 Co-J4 Co-K4 Co-B5 Own Own Own Bu-GTU Bu-HTU Co-C4	41/8x51/4 41/2x51/2 41/4x6 41/4x6 41/4x6 41/4x6 4 x51/4 41/4x51/5	B&B. B&B. B&B. B&B. Own. Own. Ful. B-L.	Cot Cot Cot Cot Own Own Ful B-L	Ti-6760 Own Own	WO WO WO WO WO WO WO WO	34x5n 34x3½ 34x3½ 36x4 36x5 36x6 36x6 36x5 36x6 36x5 36x6 36x6	34x5n 34x5 34x5 36x7 40x10 40x12 36x7 36x5 40x6 34x6k 36x4dk 36x4dk	Diamond T S Dadge Brothers. Dorris K2 Dorris K7 Dorris K7 Dort 109 Duplex GH Duplex AD Duplex AC Duplex E	1 2 3 3 1 2 1 1 1 2 2	0830	Own Own Own Own Ly-K Bu-WTU Bu-WTU Hi-400 Hi-400	37/8x41/2 4 x51/2 41/4x51/2 41/4x51/2 31/2x5 33/4x51/8 33/4x51/8 4 x51/4 4 x51/4	B-L Cov Cov B-L	Own. War. War. Own. B-L Cov Cov B-L.	Ti-6760 Own Ti-5512 Ti-6560 Ti-6660 Fl-105 Ti-5511 Sh-1501 Sh-103 Vu-4 Own	SB WO WO SB SB WO WO	36x6. 32x4n 33x5n 36x4 36x7 31x4n 33x5 35x5 35x5 35x5n 34x5 36x8	40x6d 32x4n 33x5n 36x7 36x1d 31x4n 33x5n 36x6 38x7n 36x8 36x8
mleder . KWB mleder . KWC terbury . 20R terbury . 22C terbury . 8E tocar . 21 tocar . 26 ailable . JH ailable . H	31/2 31/2 21/2-3 31/2-4 5 -6 11/2-2 2 -3 4 -6 11/3 21/3	4200 4200 2475 3375b 4275b 4975b 2200† 3450† 4650† 2450 3160 4175	Bu-YTU Co-F4 Co-J4 Co-K4 Co-B2 Own Own He-O He-O	41/xx6 41/xx51/x 33/xx5 41/xx51/x 41/xx51/x 43/xx41/x 4 xx51/x 4 xx51/x 4 xx5 4 xx5	B-L B-L B-L B-L Own. Own. Own. B-L B-L B-L	B-L B-L B-L B-L Own. Own. B-L B-L B-L	Ti-6666 Ti-6666 Ti-6460 Ti-6560 Ti-6760 Own Own Ti-6460 Ti-6460 Ti-6560	WO WO WO WO DR DR WO WO WO	36x5k 36x5k 34x4k 36x4k 36x5 36x6 34x4 34x5 34x6 36x3½ 36x4 36x5	36x5dk 36x5dk 34x6k 36x4d 40x6d 40x7d 34x6 36x8 36x12 36x5 36x8 40x5d	Fageol. Fagool Fagool Federal. R2 Federal. S23 Federal. U2 Federal. W2 Federal. X2 Ford. TT	11/2 21/2 4 6 1 11/2 21/2 31/2-4 5 -6	3000 3900 5000 5700 5700	Wa-CU Wa-DU. Wa-DU. Co-J4 Co-K4 Co-L4 Co-B5 Own	43/6x53/4 41/2x61/4 41/2x61/4 33/4x5 33/4x5 41/6x51/4 41/2x51/2 43/4x6 33/4x4	B-L. B-L. B-L. B&B. B&B. B&B. B&B. B&B.	Own. Own. Own. Own. Det. Own. Det. War. War. Own.	Own Ti-6461. Ti-6560. Ti-6666. Ti-6760. Ti-6250. Ti-6460. Ti-6560. Ti-6760. Own	WO WO WO WO WO WO WO	34x4k 36x5 36x6 33x5n 36x3½ 36x4 36x5 36x6 30x3½n	
idgeportC ockwayE2 ockwayS ockwayK	111214 1223 11223 11223 5	1450 1995 2895 3495 1595 2495 3295	He-T3 Co-N Co-N Co-C2 Co-E7 Own Own Bu Bu Bu Wi-SU Wi-SU Co-K4 Co-I4 Co-B5 Own	5 x6 31/2x5 38/4x5 41/2x51/4 41/2x51/2 4 x51/4 4 x51/4 41/2x6 4 x5 4 x5 4 x5 4 x5 4 x5 4 x5 4 x5 4 x5 4 x5 4 4/2x51/2 43/2x54 43/2x54	Ful B&B. B&B. B&B. B&B. B&B. B&B. Ful B-L	Ful Bak B-L Det Det B-L	To-A LM-7150 LM-7250 TO-E Ea-1000. Wi-60A Wi-88E Tim-6460 Tim-6560 Ti-6660 Ti-6666 Ti-6760	IG DR DR IG SB DR WO WO WO WO WO WO	36x6 35x5n 36x3½ 36x4 36x5 35x5n 35x5n 36x4 36x4n 36x4n 36x6n 36x6 36x6 31x4n	40x12 35x5n 36x5 36x4d 35x5n 34x6 36x8 36x8n 36x12n 33x5n 36x6 36x8 36x6 40x7d 40x7d	G.M.C. K16 G.M.C. K41 ††G.M.C. K41 ††G.M.C. K71 ††G.M.C. K71 ††G.M.C. K101 ††G.M.C. K101 ††G.M.C. K101 Garford 15 Garford 25B Garford 70 H Garford 80 Garford 68D Garford 150A Gary F Gary 1 Gary J Gary J Gary J Gary J Gary K	2 5 31/2 10 5 11 11/2 21/2 4 5 7/2 1 22/2	1590 2375 3250 4900 5000 5750 1775 2450 2850	Own Own Own Own Own Own Own Bu-MU. Bu-WU.	4 x5½ 4½x6 4½x6 4½x6 4½x6 3½x5½ 3½x5½ 4½x5½ 4½x5 5 x6½ 3¾x5½ 4½x5 4½x5 4½x5 4½x5 4½x5 4½x5 4½x5 4	Own. Own. Own. Own. Own. Own. Own. Own.	Own. Own. Own. Own. Own. Own. Own. Own.	Ti-6760 Ti-6760 Ti-6250 Ti-6460 Ti-6560 Ti-6666 Ti-6760 Own Ti-6352	WO	34x5n 36x4 36x5 36x5 36x5 36x5 36x5 36x5 36x3 36x4 36x6 36x3 36x6 36x3 36x4 36x3 36x4 36x6 36x3 36x4 36x5	34x5 36x7 36x8 40x5 40x1 40x6 40x1 34x5 36x5 36x5 40x6 40x7 36x8 40x8 40x8
re TR verolet Sup'r verolet Util ven 20 verolet 65 verolet 90 vero	2 1 1-114 112-2 212-3 312-4 5 -7 114	395 550 1980 2840 3480 4160 4890 1785 2650 3300	Own Own Own Bu-WTU Bu-GTU Bu-ETU Bu-YTU Bu-BTU Co-N Co-K4	41/4x53/4 31/4x4 31/4x4 33/4x51/8 4 x51/4 41/4x51/2 41/2x6 5 x61/2 33/4x5 41/6x51/4 41/6x51/4	TDOwn. Own. B-L B-L B-L B-L B-L B-L B-L	Own. Own. B-L B-L B-L B-L B-L B-L B-L	To-C139. Own Own Ti-6250 Ti-6460 Ti-6560 Ti-6760 Ti-6250 Ti-6460 Ti-6560	IG SB WO WO WO WO SB WO	36x6n 30x3½p 31x4n 34x5n 34x4 34x5 36x6 36x6 36x6 36x6 36x4 36x5	38x7n 30x3½p 34x4½ 34x5n 34x3½d 34x5d 36x6d 36x7d 34x5n 36x7 36x5d	GaryM Graham Bros Graham Bros Graham Bros Gramm-Pion10 Gramm-Pion65 Gramm-Pion20 Gramm-Pion20 Gramm-Pion30 Gramm-Pion50 Gramm-Pion50	5 1 11/2 1 11/2 11/2 2 3 4 5 -6	4450 1265 1325 1245 1750 2250 2475 3300 3850 4450 575	Bu-BTU Do Do Co-N Co-J4 Co-K4 Hi-500 Hi-200 Co-B2 Own	5 x61/2 37/8x41/2 37/8x41/2 33/4x5 33/4x5 41/8x51/2 41/4x51/2 41/2x51/4 41/2x51/4 43/4x6 35/6x4	B-L Dod. Dod. B&B. Ful Ful Own. Own. Own.	B-L Dod. Dod. B-L Ful Own. Own. Own. Own. Own. Own.	Ti-6760. Own Own Sa-1483 Cl-1D. Ea-603. Sh-103. Sh-21. Sh-21. Sh-31.	WO SB SB SB WO WO WO WO SB	36x6 33x4½1 33x4½1 33x5n 36x3½3 36x3½3 36x4k 36x5k 36x5k 36x5k 36x6k 36x6k	40x 34x 36x 36x 36x 36x 36x 36x 36x 36x 36x 32x
desdale	34-114 11/2 21/2 34 1 11/2 2 21/2 3	1300 1600 2150	Co-J4 Co-K4 HS-30 Co-N	434x6 334x5 334x5 418x514 312x5 334x5	B-L B-L B-L B-L B-L	B-L Det B-L B-L B-L	Sh-1002. Sh-1002. Sh-1501. Sh-103. Sh-21 Sh-21	WO	34x31/6k	36x7k 34x4½n 34x4k	HendricksonK	21/2 31/2 6 10 11/2 21/2 31/2	2950 3950 3050 4050 2535 3200 3725 4725	Bu-YTU Bu-ETU Bu-YTU Bu-WTU Bu-ETU Bu-YTU Wa-EU.	4½x5½ 4½x6 4½x5½ 4½x6 3¾x5½ 4½x6 4½x5¼ 4½x6 5 x6	Ful Ful Ful Ful Ful Ful	B-L B-L B-L Ful Ful Ful Ful	Sh-103 Sh-21 Sh-32 Sh-21 Sh-32 Ti-6460 Ti-6560 Ti-6760 Ti-5511 Sh-1501	WO	30X3	34x 36x 36x 36x 36x 36x 36x 36x 36x 36x 40x
bitt. AA r-Elder AN r-Elder BN r-Elder CN r-Elder CN r-Elder FN r-Elder EN r-Elder EN r-Elder AA	5 11/2 2 21/2 3 4 5 -6 1	‡	Bu-WTU Co-J4 Co-K4 Bu-HTU Co-L4.	3 ³ / ₄ x5 ¹ / ₈ 3 ³ / ₄ x5 4 ¹ / ₈ x5 ¹ / ₄ 4 ¹ / ₄ x5 ¹ / ₂ 4 ¹ / ₄ x5 ¹ / ₅	B-L B-L B-L B-L	B-L B-L B-L B-L	Sh-51 Ti-6352 Ti-6460 Ti-6560 Ti-6560 Ti-6666 Ti-6760 Wi Wi Wi	WO	36x6 34x3½ 34x3½ 36x4 36x4 36x5 36x5 35x5n 34x4 34x4½	34x4 34x5 36x7 36x8 36x5d 40x6d 35x5n 34x5 34x7	Indiana. 20 Indiana. 25 Indiana. 35 Indiana. 51 International. S International. 21 International. 31 International. 41 International. 63 International. 101	2 21/2-3 31/2-4 5 -7 1 1 11/2 2 3	1650† 2100† 2750	Wa-BUX Wa-BUX Own Own Own Wa-EU4 Ly Own Own Own Own Own Own	3½x5¼ 3½x5¼ 4¼x5 4¼x5	Own. Own. Own. Own.	Own. Own. Own. Own.	Own Own	WO WO WO IG IG IG IG	36x4 36x5 36x5 36x5 32x4½n 36x3½k 36x3½k 36x5 36x5	36x 36x 36x 40x
hby 31 hby 33 hby 35 hby 27 hby 210 hby 214 pendable CD pendable EG mond T 75 mond T O3	34-114 2 3 4 5 7 112-2 212-3 34-1 1-114		Bn-YTU Bu-Mu Bu-WU Co-W Co-J4 Co-K4 Co-B5 Co-B5 Bu-CTU Bu-ETU He-O Hi-700 Hi-1400	33/x51/4	Cov	Cov	Cl-B300* Cl-1D Cl-2D Cl-3D Cl-5D Wi-800J. Wi-900C Wi-900C Co-52021 Own Ti-6460.	SB IG IG IG VO WO WO WO	34x5n 35x5n 36x4 36x5 36x6 36x6 34x5 36x5 33x5n 36x3 ¹ / ₂ 36x3 ¹ / ₂	34x5n 38x7n 36x8 36x5d 40x6d 40x14 34x8 36x10 33x5n 36x4 36x5	Kelly-S. K41 Kelly-S. K61 Kissel. Kissel. Kissel. Kissel.	2½ 2½ 3½5 5 -7 1 1½ 2½ 4		Own Own Own Own Own Own Own Own Own		B&B. B&B. B&B. War. War. War. War.	B-L B-L B-L War War War.		WO IG IG WO WO WO WO	36x5	36x 36x 36x 36x 36x 36x 36x 36x 36x
amond TU2 amond TK amond TEL	31/2		Hi-1400. Hi-1500. Hi-200.	41/4x51/2	Cov.	Cov.	Ti-6560 Ti-6666 Ti-6760	WO WO WO	36x4k 36x5 36x6	36x8k 36x5d 40x6d	Larrabee	11-21 21-31 31-41	2400 3550 4100	Co-J4 Co-IA Co-IA	3¾x5 4½x5½ 4½x5½	B-L B-L B-L	B-L B-L B-L	Sa-1480 . Sh-1501 . Sh-22 Sh-31	WO WO	34x3 ¹ 4k 36x4 36x5	34x 36x 36x

*—Make Optional
†—Short wheelbase model
*—6 cylinders
*—All 4 cyl. engines unless
otherwise specified
††—Truck Tractor
**—Front wheel drive
b—Price includes body or cab
d—dual
k—Pneumatic tires optional
at extra cost
n—Pneumatic tires standard

ENGINE:
Bu—Buda
Co—Continental
Do—Dodge
He—Hercules
Hi—Hinkley
HS—Herschell-Spillman
Ly—Lycoming
Mi—Midwest
Wa—Wukesha
We—Weldeley
Wi—Wisconsin

CLUTCH & GEARSET
B&B—Borg & Beck
B-L—Borg & Beck
B-L—Brown-Lipe
Bak—Baker
Canm—Campbell
Cot—Cotta
Cov—Covert
Del—Detla
Det—Detroit
Ful—Fuller
H-S—Hele-Shaw
Hoo—Hoosier
M&E—Merchant & Evans

Mun—Muncie
T. D.—Twin Disc
War—Warner

REAR AXLE:
Am—American
C1—Clark
Co—Columbia
Du—Durston
Ea—Eaton
F1—Filint
LM—L-M

Ru—Russel
Sa—Sallsbury
Sh—Sheldon
71—Timken
To—Torbensen
Wa—Walker
Wi—Wisconsin
Ch—Chain
DR—Double Reduction
IG—Internal Gear
SB—Spiral Bevel
SP—Straight Bevel
WO—Worm

Current Motor Truck Specifications—Continued (This list comprises trucks distributed on a national basis)

			1		(Thi	s lis		Ī		- 11	tributed on	a nu	itroni					REAR	YLE	TIR	FS.
	eity		ENG	INE	Make	Make	REAR A	XLE	TIR	ES		Capacity		ENG		Make	Make	Te and a	l e		-
MAKE AND MODEL	Tons Capacity	Price	Make and Model	Bore and Strokes	Clutch Ma	Gearset N	Make and Model	Final Driv	Frent	Rear	MAKE AND MODEL	Tons Cap	Price	Make an	Bore and Strokes	Clutch N	Gearset	Make at Model	Final Dr	Front	Rear
Maccar EX Maccar L1 Maccar HT Maccar HT Maccar M2 Mack AB Mack AB Mack AB Mack AB Mack AC Mack	2 3 4 5 5 3 7 14 5 6 5 7 1 1 1 5 6 7 1 1 1 1 1 1 2 2 2 2 1 5 6 7 1 1 2 1 2 2 2 2 3 3 1 6 6 7 1 2 2 2 3 3 5 6 7 1 2 2 2 3 3 5 6 7 1 2 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 2 3 3 5 6 7 1 2 3 3 5 6 7 1 2 3 3 5 6 7 1 2 3 3 5 6 7 1 2 3 5 7 1 2 3 5 7	80000 3000 3450 3300 3750 3450 3450 3450 5500 6000 3400 1295 5750 6000 1295 1097 1650 2475 22000 2475 4850 1695	Bu-OU. Bu-ETI Bu-YTI Bu-YTI Bu-YTI Own Wi-SU. Wi-CA Wi-EA Wi-TA Wi-RA Own	4 x6 4 x6 4 x6 5 x6 5 x6 4 x5 4 x5 4 x5 4 x5 5 x6 5 x6 5 x6 5 x6 5 x6 1 3 x5 1 4 x5 1 3 x6 1 3 x6 1 3 x6 1 3 x6 1 3 x6 1 3 x6 1 4 x5 1 4 x5 1 4 x5 1 4 x5 1 4 x5 1 3 x6 1 3 x6 1 4 x5 1	B-L. B-L. B-L. B-L. B-L. B-L. B-L. B-L.	Own. Own. Own. Own. Own. Own. Own. Own.	Ti-6460. Ti-6560. Ti-6560. Ti-6666. Ti-6666. Ti-6760. **Own. Own. Own. Own. Own. Own. Own. Own.	WO	36x4 36x5 36x6 36x6 36x6 36x6 36x6 36x4 36x4 36x4	30x6 30x4d 36x5d 36x6d 40x6d 36x10 40x6d 36x10 40x10 36x10 36x10 36x4d 36x4d 36x4d 36x4d 36x4d 40x5d 40x12 40x12 40x14 40x5d 40x12 40x13 36x4d 36x5d 36x5d 36x5d 36x6d	Selden. 53B Selden. 70B Selden. 70B Selden. 90A Service 25 Service 33 Service 42 Service 61 Service 58 Service 103 Signal NF S	335 1123 35 1123 4 6 1233 5 7 11123 5 7 11123 1 2 2 3 5 5 7 1 1 1 1 2 3 1	1695 2795 3645 4495 405 3240† 3700† 4750† 5400† 6000† 6500† 1195 1595 1970 2690 3590	Co-IA Co-IA Co-IA Co-IA Co-B5 Bs Bs.	334x5 419x514 419x514 434x6 339x444 4 x53 4 x53 4 x53 439x54 5 x61 5 x61 334x5 144x51 142x6 334x5 144x5 1334x5 145x6 334x5 145x6 334x5 145x6 334x5 145x6 334x5 145x6 334x5 145x6 135x6 145x6 135x6 145	B-L. B-&B B-&B B-&B B-&B B-&B B-&B B-&B B-&	B-L. B-L. War B-L. War B-L. Own Own Own Ful. Ful. Ful. Ful. B-L.	11-6352. Ti-6560. Ti-6666. Ti-6760. Ti. Spec Ti-6460. Ti-6560. Ti-6660. Own. Own. Own. Ol-AW. Cl-1D. Cl-2D. Cl-3D. Co-5200 Sh-1501 Sh-103.	WO.	36x5k 36x6k 36x6k 34x5n 34x3½ 36x4 36x5 36x4 36x5 34x4 36x5 34x4 36x5 36x6 33x5n 36x4 36x5 36x6 30x3½ 36x4 36x5 36x6 36x6 36x6 36x6 36x6 36x6 36x6	36x5k 36x6k 36x4dk 40x5d 40x6d 40x6d 40x7d 34x4½n 35x5n 34x6k 34x8k 36x12
Nash. 201 Nash 4017 Nash 301 Nash 50 Noble A2 Noble B3 Noble D5 Noble E7 Old Reliable Old Reliable Old Reliable Old Reliable Old Reliable Old Reliable	F 2-2½ 8 2-2½ 8 2-2½ 15 1 11 1¼ 11 2½ 11 3½-5 B 2½ C 3½ K 7¼	3500 4250 5000 6000	Own	334x5; 334x5; U 334x5; U 334x5; U 434x5; U 434x6 U 434x6 U 434x6 U 434x6 U 434x6 U 434x6	B&B B&B B&B Ful. Ful. Ful. Ful. Own Own B&B	Own Det. Det. Ful. Ful. Ful. War Ful. War War	Sh-21 Sh-30 Sh-31 Sh-51 Own To-OX21	IGIGIGSBWOWOWOWOWOWOIGIG	36x6 34x4 34x4 34x4 34x45 36x4 36x4 36x5 36x6 36x6 35x5n	36x6 36x6 34x7 34x7 34x4½ 34x5 36x7 36x8 36x10 36x8 36x12 40x12 40x12 40x14 35x5n	Thomart. 2 Tiffin. GV Tiffin. MV Tiffin. F3 Tiffin. TV Tiffin. UV Titan. Titan. Titan. Traffic. Traffic. Traffic. Transport. Transport.	0 11/4 V 11/4-2 V 12/2-3 5 31/2-4 V 5 -6 -7 -21/2 -5 -11/2 -2 -2 -3 -12 -3 -5 -11/2 -3 -5 -11/2	1795 2100 2700 3600 4300	Hi-400. Co-C4 Co-C4 Co-B2 Co-B2 Bu-HTI Bu-YTI Bu-YTI Co-N Co-N Co-N Co-N Bu-WT	4 x5 x 4 x 5 x 4 x 5 x 4 x 5 x 5 x 4 x 5 x 5	War Ful. Ful. Del. B&B B&B B&B B&B Cov. Cov. Ful.	War Ful. Ful. Cot. Cot. Cot. Cot. Cov. Cov. Cov. Ful. Ful.	Ea-1003 Sh-103 Sh-21 Sh-31 Sh-51 Sh-51 Own Own Ru Ru-300 Ru-600 Co-510 Cl-1D	WO. WO. WO. WO. WO. DR. DR. DR. IG. O. IG. 23 SB. IG.	. 36x4 . 36x5 . 36x6 . 36x4 . 36x5 . 36x5 . 35x5n . 34x3½ . 36x4 . 32x4½ . 34x3½	34x5
Oneida. Oneida. Oneida. Overland91c PatrietReve PatriotLinco PatWashingt Pierce-ArrewX Pierce-Arrew.W Pierce-Arrew.W Pierce-Arrew.W Pierce-Arrew.B	C 2 ½ D 3 ½ re 1 lin 2 on 3 (A 2 IB 3 /C 4 D 5 IE 6	3200 4050 390 1350 240 300	6t Hi-400 0 Hi-400 0 Hi-200 5 Own 0 Co-N. 0 Hi-400 0 Hi-200 0 Own	4 x5 . 4 x5 . 4½x5 . 3½x4 . 3¾x5 . 4 x5 . 4½x5 . 4 x5	Ful. Ful. B&B B&B Cov. Cov. Own	Ful. Ful. Own	. Wi-900C Ti-6652.	WO. WO. SB WO. WO. WO.	. 36x4 . 36x5 . 30x3½ . 35x5n . 34x4k . 36x5k . 36x4	36x7 36x7 36x10 n 30x3½n 35x5n 34x4k 36x8k 36x5d 36x5d 36x6d 36x7 40x7d 40x8d	Transport. Transport. Transport. Transport. Transport. Traylor Traylor Traylor Traylor Traylor Traylor Triangle A Triangle Triangle Triangle Ultimate A	55 3 51 3 ½ 75 5 B 1 ½ C 2 D 3 F 5 A 1 A 1 ½ 2 C 2 2 ½ B 2 ½ 3	1985 2285 2585	Bu-ET Bu-YT Bu-WU Bu-ITU Bu-HT Bu-YT HS-700 Wa-BU Wa-BU Wa-FU	4 18x5 1 4 14x5 2 4 14x5	Ful. Ful. B&H Cov Cov B-L Ful. Ful. Ful.	Ful. Ful. S. Cot Cov. Cov. B-L Ful. Ful. Ful. Ful.	Cl-2D. Cl-2F. Cl-3D. Sh-150 Sh-103 n. Sh-21. Sh-32. Cl-E36 Cl-ID. Cl-2D.	IG. IG. IG. WO WO WO 0. SB. IG. IG.	36x4 36x5 36x5 36x4 36x4 36x4	36x8 36x8 36x12 34x6 36x7 36x8 40x6d n 34x4½n 34x7k 36x7k 36x8k
Rainier R Rainier R Rainier R Rainier R Reo Reo Republic 1 Republic 1 Republic 19 Republic 19	29 1 36 1½ 28 2-2½ 20 2½ 25 3½ 27 6 .F 1½ .F ½ 3 1 1 1 4 1 X 2 1 9 3 20 4½	3 355 5 440 510 118 148	70 Co-N. 70 Co-N. 70 Co-J4. 70 Co-K4 70 Co-K4 70 Co-K4 70 Co-L4 70 Co-B5 70 Own. 70 Ly-C7 71 Co-J4	334x5 334x5 334x5 418x5 412x5 42x5 434x6 418x4 334x5	B-L B-L B-L 14 B-L 14 B-L 15 B-L 10 Own 15 Own Ful Ful	B-L. B-L. B-L. B-L. B-L. B-L. B-L. B-L.	Ti-6250 Ti-6250 Ti-6250 Ti-6460 Sh-103 Ti-6560 Ti-6666 Ti-6760 To-CT2 To-CT2 To-CT2 To-E	WO. WO. WO. WO. WO. WO. SB. SB. IG. IG. IG.	35x5n 34x3 34x3 36x4 36x5 36x6 34x4 33x5n 34x4 36x4 36x4 36x4 36x4 36x4	34x5 34x7 36x8 36x5d 40x6d 40x6d 33x4½n 33x5n 34x6 36x8 36x8 36x8	Ultimate Ultimate United H'way United United United United United States.	B 3 D 5 15 3/4 30 11/2 35 2 50 21/2 C 31/2 U 11/4 W 2 R 3 . S 4	1878 2221 2524 3377	He-O. He-O. Bu. Bu-WT	0. 3½x5 . 4 x5 . 4 x5 . 4 x5 . 4¼x5 . 3¾x5 . 3¾x5	B-L B-L B-L Ful Ful Ful	B-I B-I B-I B-I Ful Ful	Co-310 Co-520 Wi-50. Wi-60. Sh Cl-B	WO WO 000 SB. 000 SB DR DR WO SB. IG.	36x4 36x7 32x4½ 34x5n 34x5n 36x5 36x5 36x3½	36x8 40x14
Rewe	0W 2 0W 2½ 0W 3 1W 4 5W 5 .15 34 .0R 1¼ .40 2	13° 20° 22°	95 Own. 95 Own.	4 x x x x x x x x x x x x x x x x x x x	5 B-I B-I	B-I B-I	Sh-103. Sh-21. Sh-21. Sh-31. Sh-51. Co. Co-520 Wi-65.	WO WO WO WO SB. DR	36x7 36x7 32x4½ 34x5n 34x5n	34x5n	††Walter ††Walter Walter White	80 6 FL 2 .F 5 FR	315	0 He-O. 0b He-O. 0b He-O. 0b Co-L4.	4 x5 4 x5 4 x5	Ful Ful Ful	Ful Ful Fu	Wi-88	000 SB. DR E. DR O. DR	33x5n 34x3½ 36x1k 36x5	36x8k 36x10 40x8 40x6 40x7d 34x5n
Sandow. CG Sandow. Sandow. Sanford. Sanford. Sanford. Sanford. Schacht. Schacht. Schacht. Schacht. Schacht. Schacht. Schacht. Schacht. Schacht. Schacht. Schacht. Schacht.	. J 21/2 M 5 . 10 3/4- . 15 11/2 . 25 21- . 35 31/2 . 50 5 	25 32 38 44 44	95‡ Co-N 50‡ Co-C 25 Co-Bi Co-Si Co-C Co-E Co-Bi Co-W Wi-U 900 Wi-U 900 Wi-U 900 Wi-V 900 Wi-V 900 Co-J 250 Co-K	34xx 4/4xx 5. 43/4x 35. 43/4x 33/4x 4. 4/8x 4. 4/8x 4. 4/4x 7. 5 x 4 x AU 4/4x AU 4/4x AU 4/4x AU 4/4x 4. 33/4x 4. 33/4x 4. 33/4x 4. 4/8x 4. 6/8x 4. 6/8x	5 Full 5 5 5 6 6 6 6 6 5 5	B-I B-I B-I B-I B-I B-I B-I B-I B-I B-I	L. Ti-6566 L. Ti-6766 L. Sa-D. L. Sh-150 L. Sh-21.	0 WC 0 WC SB. 1. WC	0 36x4 0 36x6 0 36x3 0 36x4 0 36x5 0 36x6 0 36x6 0 36x5 0 36x5 0 36x5 0 36x5 0 36x5	36x7 40x12 33x5n 36x5k 36x5d 36x5d 40x14 36x7k 36x7 36x7 36x5d 40x6d 40x7d	White White Wilcox Wilcox Wilcox Wilcox Wilcox Wilcox Wilson Wilson Wilson Wilson Wilson Wilson	20 2 40 3½ 45 5 AA 1 BB 1½ CC 2½ EE 3½ F 5 F 1½ EA 2½ G 3½ H 5	325 420 450 190 255 300 398 435 131 222 285 364 457	1	33/x5 41/x5 41/x5 FU 33/x5 41/x5 FU 43/x5 FU 43/x6 FU 43/x6 4 x6 33/x7 41/x5 41/x5 43/x7 43/x7 43/x7 43/x7		M. Own n.	m. Own. t. Ru-36 m. Wa-22 m. Wa-52 m. Wa-54 t. Ti-65 t. Ti-66 t. Ti-67 t. Ti-67	DF DF 00. SP A. DF A. DF A. DF A. DF A. DF GO. WC GO. WC GO. WC GO. WC GO. WC GO. WC GO. WC		36x5d 34x5n 36x5k 36x5k 36x5dk 40x6dk

ES

Rear

36x7k
46x10k
40x12
43x5h
40x12
40x74

34x5n
36x5
36x3
36x3
40x5d
40x5d
40x6d
40x12
36x8
40x10
40x12
35x5n
34x5
36x7
36x8
36x8
36x8
36x8
36x8
36x8
36x8
36x7
36x8
36x7
36x8
36x7
36x8
36x7
36x8

36x6 36x8 40x14 32x4½n 34x5n 34x7n 34x8 36x5d 36x5d 36x5 36x6 36x6 40x6d 40x6

36x6 33x5n 34x5k 36x8k 36x10

40x8 10x6 10x7d 34x5n 36x7d 10x5d 10x6d 25x5 38x7k 40x8k 36x8 36x5k 36x5k 36x5dk 40x6dk

33x5n

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

	CANADIAN																				
			ENG	INE			REAR A	XLE	TI	RES				ENG	INE			REAR /	XLE	TI	RES
MAKE AND MODEL	Tons Capacity	Price	Make & Medel	Bere & Stroke§	Clutch Make	Gearset Make	Make & Medel	Final Drive	Front	Rear	MAKE AND MODEL	Tens Capacity	Price	Make &	Bore & Strokes	Clutch Make	Gearset Make	Make &	Final Drive	Front	Rear
otfredson20 jotfredson40 jotfredson50 jotfredson80 jotfredson100 MapleleafAA MapleleafBB MapleleafBB MapleleafDD	11/4-3 21/4 5 5 11/4 2 3	3290 3775 4775 5800 3000 3600 4050 4800	Bu-WTU BU-GTU Bu-EtU Bu-YTU Bu-BTU Hi-300 Hi-400 Hi-500 Hi-1600	4x51/4 41/4x51/2 41/2x6 5x61/2 33/4x51/4 4x51/4 41/4x51/2	B-L B-L B-L Ful Ful Ful	B-L B-L B-L Ful Ful Ful	Ti-6460 Ti-6560 Ti-6666 Ti-6760 Sh-1501 Sh-103 Sh-21 Sh-31	WO WO WO WO WO WO	36x4 34x5 36x6 34x5n 36x4 36x4 36x5	34x5n 38x7u 36x8 36x12 40x14 36x6n 36x7 36x7 36x6d 36x6d	NationalOA	11/2 21/2 31/2	2750 3750 4750 6150 2699 3699 4200	Wa-BUX Wa-CU Wa-DU. Wa-EU	33/x51/ 43/x53/ 41/2x61/ 5x61/ 33/x51/ 41/x51/ 41/x51/	B-L H-S H-S B&B. B&B.	B-L. B-L. B-L. Cot. Cot. Cot.	Ti-6352 Ti-6460 Ti-6560 Ti-6666 Ti-6760 Sh-1501. Sh Sh-21 Sh-21	WO WO WO WO WO	34x4k 36x5 36x6 36x6 34x5n 36x4 36x4	35x5n 34x6k 36x10 36x12 40x14 34x5n 36x7 36x7 36x7

Current Tractor Specifications

	1 1.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1											-											
MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plows	Price	Make	Ne. of Cyls Bore & Streke	Weight (Lbs.)	†Traction Members. Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plows	Price	Make	No. of Cyls. Stroke	Weight (Lhs.)	Traction Members. Dimension, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plows	Price	Make	No. of Cyls. Bore & H	Weight (Lbs.)	†Traction Members. Dimensions,Diameter & Face (Ins.)
Allis-Chalmers. Asser. As	20-38 16-30 15-30 30-60 15-30 22-45 30-60 25-50 25-50 25-50 25-50 25-35 30-40 15-25 25-35 30-40 15-25 25-35 20-30 10-2 25-35 20-30 10-2 25-35 20-30 10-2 25-35 20-30 10-2 25-35 20-30 10-2 25-35 20-30 10-2 25-35 20-30 10-2 25-35 20-30 10-2 25-35 20-30 10-2 25-35 20-30 10-2 25-35 20-30 10-2 25-35 20-30 10-2 21-2 2	3 4 4-5 3 3 3-4 6 8-10 3-4 5-5 6-6 8 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 4-5 8-10 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1285 1885 1695 1495 1295 1900 3100 4400 4250 2385 895 1350 2650 4900 420 420 420 1000 1600	Own. Own. Own. Own. Own. Own. Own. Own.	4-7 1 8 1 5 1 6 3 1 4 1 4 1 5 1 6 3 1 4 1 4 1 5 1 6 1 4 1 4 1 5 1 6 1 6 1 6 1 6 1 6 1 6 1 6 1 6 1 6	8500 6000	46x12 50x12 50x14 48x14 48x12 48x12 70x12 70x20 90x24 50x12 60x16 69x20 87\$x20 87\$x20 84xx 8\$x 48x12 60x12 72x20 84xx 84xx 84xx 84xx 84xx 84xx 84xx 84x	Minneapolis	-20 -30 -40 9-16 5-10 12-25 15-30 12-25 15-30 12-25 10-20 10-20 10	2 3 3 4 4 2 3 3 4 6 6 12-16 3 3 3 3-4 4-5 6-8 8-10 3 4 10 3 4	985 375 1275 1600 850 1250 725 725 725 725 725 725 725 725 725 725	Own. Own. Own. Own. Wau. LeR. Wau. Mid. Bea. Own. Own. Own. Own. Own. Own. Own. Own	4-4x54 4-4x6 4-4x54 4-4x5 4-5x6 4-5x6 4-4x5 4-5x6 6-5x7 4-4x5 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-4x7 4-2x	12000 15000 13500 20500 30000 6500 24000 6638 9506 12968	46x10 52x18 52x18 54x 8 57x10 46x 6 60x10 60x10 50x12 52x12 40x14 54x14 66x20 x12 48x12 42x12 56x12 56x12 56x12 66x20 85x30 84x 8 66x10 66x20 85x30 66x10 66x20 85x30 66x10 66x20 85x30 66x10 66x20 85x30 66x1	Russell. Shaw-Enochs (Gr.) Topp-Stewart. B Tore. Townsend. Townsend. Townsend. Trayler. Twin City. Twin City. Twin City. Uncle Sam. C-20 Uncle Sam. B-21 Wallis. OK Waterloe Boy. N Wisconsin. Wisconsin. Wisconsin. Wisconsin. Fall. (Jack) Beeman. B. Beeman. K Bolens. Centaur. 1923 Do-It-All. (Baby) Do-It-All. (Baby) Do-It-All (Twin 12) Kinkade. M.B.M. Red. E Moter Macultivater N.B. 2. Utiliter. 501 Utiliter. 501	15-30 -60 -6-10 10-20 20-36 -6-12 20-36 -6-12 20-36 -6-12 20-36 12-20 20-30 15-27 115-25 16-30 22-40 -7 115-25 16-30 22-40 -7 115-25 16-30 22-40 -7 115-25 16-30 15-27 115-25 16-30 15-27 115-25 16-30 15-27 115-25 16-30 15-27 115-25 16-30 15-27 115-25 16-30 15-27 115-25 16-30 15-27 115-25 16-30 15-25 16-30 15-25 16-30 15-25 16-30 15-25 16-30 15-25 16-30 15-25 16-30 15-25 16-30	3-4 4-5 8-10 4-2 2-3-3-4 4-8 1 3 5 8 2-3 3-4 4-5 8 N 1 1 1 1 1 1 1	\$675 800 1350 500 22750 4750 2750 4750 2750 1800 2750 1800 2750 1800 2750 1800 250 1	Cli. Cli. Cli. Cli. Cli. Cli. Cli. Cli.	2-10x12 4-5 x 64 4-54x7 4-8 x 10 4-34x4 4-34x4 4-34x4 4-34x4 4-34x6 4-34x6 4-34x6 4-34x6 4-44x6 4-54x7 4-54x7 4-54x7 4-54x7 4-54x7 1-24x24 1-34x34 1-	00000 79000 22550 4400 7800 4500 1500 11500 11500 11500 11500 11500 1250 3000 3660 5869 5869 5750 10130 R S 10000 210 800 800 180 410 410 750 925	56x 18 60x24 60x24 60x24 46x12 50x12 50x12 50x12 50x12 50x12 52x12 52x12 52x12 52x12 52x12 52x13 52x13 16x 3 28x 4 22x 54 2434x

B&S-Briggs & Stratton

Ben-Beaver Bud-Buda Cli-Climax Her-Hercules Lyc-Lycoming Mid-Midwest N-W-New Way Ste—Stearns Wau—Waukesha Wei—Weideley Wis-Wisconsin
†-Unless otherwise specified all traction members are of the wheel type.

*—Track Type, length of ground contact surface ‡—Drum Type

Current Taxical Specifications

										RICAL TEM				REAR AX	LE
NAME AND MODEL	Price	Wheel Base (Ins.)	Tire Size (Ins.)	Weight (Lbs.)	Make and Model	No. of Cyls., Bore and Stroke		Carbu- reter Make	Generator and Starter Make	Ignition Make	Clutch: Type and Make	Gearset Make	Univer- sal Make	Type and Make	Gear Ratio
Checker	\$2340	117	32x4½	4100	Buda-WTU	4-33/4x51/4	22.50	Zenith	Westing	Bosch	m-d Fuller	Fuller	Blood	%F-Columbia	4.87
Dadge	1950	116	32x4 30x31/4	2200		4-37/4x41/2 4-25/4x41/2	24.03 11.03	Stewart.	North E	North E	m-d Own m-d Fuller	Own	m-Own	1/2F-Own	4.54
Driggs	2100	108½ 118	33x4½	3415	Own	4-35/8x5	21.03	Cortor	Doloo.	Delcott	s-p Borg & B	Muncie	Potors	3/F-Saliahury	4.75
Elcar 6	2450	118	33x41/2			6-33/x41/2	27.34	Strom	Delco	Delcott	s-p Borg & B	Warner.	Spicer	3/F-Salisbury	4.75
KelseyE	1900	112	32x4	3500	Lycoming CH	4-31/2x5	19.60	Zenith	Bosch	Bosch	s-р В & В	W-M	m-Spicer	3/F-Sals	5.10
rennant	2895*	115	33x41/2	3800		4-334x51/8			Westing	Bosch	m-d Fuller	Fuller	Blood	3/F-Columbia.	4.87
Premier	2910	118	33x41/2	3850		4-334x51/8		Zenith						3/F-Columbia	4.70
Rauch & LangT	2350	112	32x4	3200	Buda-WTU	4-31/4x51/8	22.50	Zenith	Dyneto‡	Bosch	s-p Detroit	Detroit	Spicer	1/2F-Standard	5.10
Rauch & Lang	0007	102	33x43/4			Electric		None	V	None	None				8.6
White 15A	2085	113 119	33x41/2 34x41/2			6-3-1-x5 4-3-4-x51/s	24.30 22.50	Zenith	North,E	North E	m-d Owns-p Own	Own	OWIL	34F-Own	4.70
Willys-KnightA	2250	118	32x41/2	3300		4-25/x41/2			Auto-Lite	mad Own	Own	Own	Own	3/F Own	5.12
Tellow 04	2340	109	32x41/2			4-33/8x5	18.23	Zenith	tNorth Et	Bosch	m-d Brown-L.	Brown-L.	Spicer	F-Timken.	4.90
Tellow		109	29x41/2			4-33/x5		Zenith	North.Et.	Bosch	m-d Brown-L.	Brown-L.	Spicer	1/2F-Timken	4.90

ABBREVIATIONS:-Electrically driven
-Delivered New York

Cont—Continental
†—At extra cost
††—High tension magneto optional

t—Generator supplied only Strom—Stromberg Westing—Westinghouse

North. E.—North East S-P—Single Plate M-D—Multiple Disk Borg & B—Borg & Beck Brown-L—Brown-Lipe

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

		I	RICES				(Ins.)	Ŧ			ENGINI	E		ELECT	RICAL			9	REAL	R	Service
OPEN	N MOI	ELS		CLOS	ED MO	DELS	Base (I	e (Ins.)††	NAME AND		S S	ower (.)	ter	rter		Type	: Mak	d: Type ke	anul		S. Ser
Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	5-7 Pass.	Wheel B	Tire Size	MODEL	Make and Model	No. of C Bore and Stroke	Rating (N.A.A.	Carbure Make	Generat and Star Make	Ignition Make	Clutch:	Gearset: Make	Universal: and Make	Type and Make	Gear	BRAKES.
1950	\$1695 1195	\$1760	\$1885d 1445c	\$1425	\$2195‡ {1495 1695	\$2550 d1895p	127 115	33x4½ 32x4*		H-S91 Cont7 U	6-3½x5 6-3½x4¼	29.40 23.44	Strom Zenith	G-D West	A-K West	s-p B&B s-p B&B	War Durston.	m Hart f Good.	F Salis	5.10 5.75	RLI
		1595					122	32x4*	Anderson50	Cont8 R	6-33/8x41/2						-	f Good.	_	1	
	1395 2485 1095 1695	2535 d1295p	1365d 1935d	1695d	1995 3485 1595 2245‡	p2195d 3585 1845d 2445	120 130 114 $\{122$ 124	32x4* 33x5 31x4* 32x44*	Apperson	Falls T8000 Own Cont7 U Own	6-31/8x41/4 8-31/4x5 6-31/8x41/4 6-31/4x5	33.80 23.44	Johnson. Strom	Remy	Remy	s-p Rock m-d Own s-p B&B s-p B&B	Own Warner	m Thie m Univ	1/2F Col. 1/2F Own 1/2F Col. 1/2F Col.	4.25	RL
	1395		1495d	1685d	(1850 2250p		118	32x4	Barley6-50	H-S40	6-3½x5	25.35	Strom	Delco	Delco	s-р В&В	Fuller	f M&E.	¾F Col.	5.10	FL
935 275	965 1295		800g 1135g	1395c 1995c	1495 1695		109 120	31x4 32x4	Buick1924 Buick1924	Own	4-33/8x43/4 6-33/8x41/4	18.23 27.34	Marvel Marvel	Delco Delco	Delco Delco	m-d Own m-d Own	Own	m Own m Own		4.66	
1385g		1565	1675a 1725d	1945e	\2095 \2235‡ \2385d	{2285 2795‡	128	32x4½	Buick 1924	Own	[6-33/8x43/4	27.34	Marvel	Delco	Delco	m-d Own	Own	m Own	F Own	4.70	FL]
085	3085	3085		(3875 3275e	3950	∫3585	132	33x5	CadillacV 63	Own	8-31/sx51/s	31.25	Own	Delco	Delco	m-d Own	Own	m Spicer	F Tim	4.50	F}-
750	1790	2475	2230d	2480c	2575	3325	122 132	32x4½ 33x5	CaseX CaseY	Cont8 R Cont6 T	6-3\%x4\\\2 6-3\%x5\\4	27.34 31.54	Schebler. Rayfield.	Delco	Delco	m-d Own m-d Own	Own	f Snead f Snead	1/2F Col.	4.90	RL
	1185	1295	1335d		1535	2095	117 122	32x4 33x4½ 32x4*	Chalmers6 Chalmers6 ChandlerSix	Own	$6-3\frac{1}{4}x4\frac{1}{2}$ $6-3\frac{1}{4}x4\frac{1}{2}$	25.35	Strom	A-L	A-L	s-p Mech s-p Mech s-p B&B	Warner	m Mech.	16F Tim	15.13	3 R4
490	1485 1685 495	1635 395g	17890	1895d 2095 f 340		2995§ 725c		30x3½		Own	6-3½x5 4-3½x4		Zenith)					m Own			
525 085	1335 1045	1395d	1145d	d1795‡	1625 1295	1895d ∫1495d		29x41/6	ChryslerSix	Own	6-3 x43/4	21.60	Holley. S Ball&B	A-L	Remy	m-d Own	Own	m Detr	1/2F Own	4.60	FL
175	2175	2175	1295d		1395 3075	1445d d3075‡	1271/4		ColeMaster		6-314x41/2 8-31/2x41/2					s-p B&B m-d Nort		m Mech. m Spicer		4.70	
	1095		1195d		1575	1775d	115	31x4*	ColumbiaLight Six				Strom	,		s-р В&В		m Spicer			
395p	1295		1595c	1495	2195p	1895‡	116	32x4	Courier	Falls 8000	6-31/8x41/4	23.44	Strom	West	A-K	s-р В&В	Muncie	f Flex	3/4F Col.	5.10	RL
	3100 5800	3100 6300	3500c		4500 7650		$^{138}_{138} \\ ^{132}_{142}$	33x4½ 33x5 33x5	Crawford23-6-70 Crawf'd-Dagmar6-70 CunninghamV4	Cont6 T	6-35/8x51/4 6-35/8x51/4 8-33/4x5	31.54	Zenith Zenith Strom	West West Delco	Bosch. Bosch. Delco.	m-d B-L m-d B-L m-d Own	B-L B-L Own	m Spicer m Spicer f Snead	1/4F Tim 1/4F Tim F Tim	4.23	. RL
295 595 865	1295 1595 895	· • • • • • • • • • • • • • • • • • • •	1495c 1055d 1025b	1035	1795 2095 (1250 1385	1895c 2195 {1545d 1535c	118	31x4* 31x4 32x4*	Davis	Cont8 R Own	6-31/8x41/4 6-33/8x41/2 4-37/8x41/2	23.44 27.34 24.03	Strom Strom Stewart	A-L A-L N.E	A-L A-L N.E	s-p B&B s-p B&B m-d Own	Warner Warner Own	m Peters m Peters m Own	1/2F Tin 1/2F Tin 1/2F Own	5.10 5.10 4.54	RL RL RL
3500 1990 1040	3950 1095 6250 1990 890	3950 6750	4150c 1245c 6500c 1065d	1535d d7800‡ 2950	5550 1595 7500 2950 (1365 1465	5800 d1535‡ 7800	134 124	32x6 31x4* 33x5 32x4½ 31x4	Dorris	Uwn	8-27/8x5 6-31/2x5	23 41	Strom Carter Strom Strom Tillotson	Bosch	Rosch	m-d Own m-d Detl s-p Own m-d B-L s-p Own	Own: B-L	m Spicer m Ther f Cli m Spicer m Spicer	34F Fln 12F Own F Col	4.66	6 R1- 0 F2- R1-
	995 1220 1395 1895 850		1420	1425d p1850d 11995d 2145	1650	p1625d 1490‡ p2195d d3000‡	113 118 118	31x4* 31x4 32x4* 32x44* 31x3 ³ / ₄	Elcar. 4-40 Elcar. 6-50 Elcar. 6-60 Elgin. 25 Essex. 6	LycCF Cont7 U Cont8 R Falls T8000 Own	6-3\%x4\\\2\6-3\\8x4\\\4	21.03 23.44 27.34 23.44 16.54	Zenith Strom Strom Strom Stewart.	Deleo A-L Deleo DeJon Bosch	Delco. A-L Delco. DeJon. Bosch.	8-p B&B 8-p B&B 8-p B&B 8-p B&B m-d Own	Warner Warner Warner Warner	m Mech m Mech. m Hart f Snead m Spicer	1/2F Sali 1/2F Sali 3/4F Sali 1/2F Col 1/2F Own	8 4.70 8 4.70 8 4.70 4.60 1 5.40) RL) RL 0 RL 6 F2
395		p1695d	1630b					32x41*		Cont. Spec.	6-33 ax5	27.34	Strom.	DeJon.	Delign.	s-p Own	Warner.	m Spicer	⅓F Ad.		. R1
265 r	295 s 1950	230g		525 J	685 2250	§2950d	A COUNTY	82x41*	FordT Franklin10-B		4-3%x4 6-31/x4	42.50	Holley	Own	Own.	m-d Own.	Own	m Own	%F Own	13.6	
895	895 630	995d	1095 720d	1145 750	1445 895	‡1335d	112 104	32x4- 30x3½	Gardner,Series 5 Gray		111	21.76	Zenith	West	West.	s-p B&B. s-p Own.	Mech.	m Peters	3/F Fln	4.8	0 R1
2250	2250 2650	·			3350		-120 126	32x4½ 32x4¾*	H.C.S Series 4 H.C.S Series 6	Weid Own	4-33/4x51/2 6-31/2x5	22.50	Strom	Delco.	Delco.	m-d B-L	B-L	m Spicer	3/F Own	4.6	3 R2
395	1395 1775		1495c	2175c	2195 2350	(2205.1	121 121	32x4 32x4	Hanson66 Hatfield6-55	Cont8 R H-S40	6-33/8x41/2 6-31/4x5	27.34 25.35	Marvel.	Delco Bosch	Delco. Bosch.	m-d B-L m-d B-L s-p B&B s-p B&B.	G-L Durston	m Univ m Spicer	F Tin	4.6	6 R
	1295 1395 1350	1425	\1750d		1845 1895 1475	2295d 2495d 2145	126	32x4½ 34x4½	HudsonSuper 6	Own	6-3½x5	29.40	Rayneid	L-N	Kingst	m-d Own m-d Own m-d Long.	Mech	m Thie	1/2F OW	11.4	IR
175	1175	******	\1195d	{1445 1425d			115	32x4	HupmobileSeries R	Own	4-31/4x51/2	-									
165 850		960g	1220d	‡1325d	(1695p		112	31x4*	JewettSix		6-31/4x5	1.	Ray		1	m-d Long.	1 . 1 .				
800	1775 2095			2385e	2585	2785	120 124½	32x4* 32x41*	JordanH&L	Cont. Spec.	6-3-4x434 6-3-6x434	26.34	Strom	Delco.	Delco.	s-p Detrs-p Detr	Detroit.	m Thie	12F Tin	14.4	2 F
1595 1795 2185	1595 1795 {1685 {1885	1595e 1795e 2085e	1995c	2500	1995 2295 (2385 (2685	2400 2625 (3385 (3485	120 124 121	32x4½ 32x4½ 32x4¾	King. L King. K Kissel	Own	8-3 x5	28.80	Ball&B.	West	A-K	m-d Detr. m-d Detr. s-p B&B.	Own	f Univ	F Col	. 4.8	8 R1

†—Four Wheel Brakes optional at extra cost on all models. *—Balloon Tires optional at extra

-Balloon Tires optional at extra cost.

a—2 Passenger b—3 Passenger c—4 Passenger d—5 Passenger d—5 Passenger d—5 Passenger d—5 Passenger d—6 Passenger d—7 Pice without starter and demountable rims. Price, complete, \$350.

-Price without starter and demountable rims. Price, complete, \$350.

A-L—Auto-Lite

Ad—Adams
Anst—Ansted
B & B—Borg & Beck
B-L—Brown-Lipe
Ball & B—Ball & Ball
Cle—Cleveland
Cli—Climax
Col—Columbia
Cont—Continental
Detl—Detlaff
Detr—Detroit
Dool—Dooley
Dues—Duesenberg
Eat—Eaton
Eisem—Elsemann
Flex—Flexite

Fin—Flint
G-D—Gray & Davis
G-L—Grant-Lees
Good—Goodrich
H-S—Herschell-Spillman
Hart—Hartford
Hoos—Hossier
Kingst—Kingston
Kn'gt—Knight Type
L-N—Leece-Neville
L-yc—Lycoming
M & E—Merchant & Evans
Mech—Mechanics
N. E.—North East
Nort—Northway
Pen—Penfield

Rock—Rockford
Salis—Salisbury
Spec—Special
Split—Splitdorf
Std—Standard
Strom—Stromberg
Thie—Thiemer
Ther—Thermold
Till—Tillotson
Tim—Timken
Univ—Universal
W-M—Willys-Morrow
Wag-R—Wagner or Remy
Walk—Walker
War—Warner
Weid—Weldely

West—Westinghouse
Wise—Wisconsin
Y. & T.—Yale & Towne
F.—Floating
½ F.—Semi-Floating
¾ F.—Three Quarter Floating
c.—Cone
f.—Fabric
m.—Metal
s-p.—Single Plate
m-d.—Multiple Disc
F.—Four Wheels
R.—Rear Wheels
T.—Transmission
1—Contracting
2—Expanding

BRAKES. Service and Emergencytt

O RLTH

66 FLR2

70 F1-R2 50 F1-R2

77 R1-R2 60 FLT1 90 RLT1

70 R1-R2

80 R1-T1

10 R1-R2

R1-R2 R1-R2 R1-R2

10 RLR# 10 RLR# 54 RLR

77 RLR2
66 RLR2
90 F2-D1
RLR2
33 RLR2

70 RLR2 70 RLT1 70 RLR2 66 F2-T1 40 RLR2

73 TLR1

80 RLT1 90 RLT1

63 R²-R²
36 R²-R²
66 R¹-R²
63 R¹-R²
41 R¹-T¹

45 RLR2 87 RLR2

54 RLT1

42 F1-R2 42 F1-R2

88 R1-R2 88 R1-R2 42 R1-T1

Floating



Write for Catalog 241MA. It shows you how to make more money on over 110 Ford and Fordson jobs.

Sleeve Driver and Puller-just as easy to replace and fit the Drive Shaft Bushing with Stevens Bushing Extractor, Driver, Reamer and Refacer-nothing to the pulling of the Pinion and Transmission Drive Gear with Stevens Duplex Gear Puller -the Giant Punch expels and inserts the Knuckle Pin in an instant-and at the end, see how easily the Universal Joint is slipped in with Stevens Tongs. Order this chest of ten special Stevens Speed-Up Tools today. Each cent it costs means dollars of extra profits for you. Stevens & Company New York 375 Broadway "Thru your jobber-his service is economy.

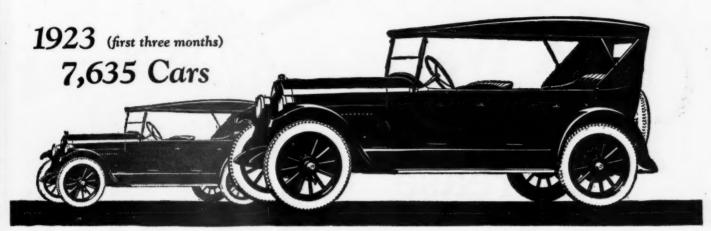


Tools

Current Passenger Car Specifications (This list comprises cars distributed on a national basis)

PRICES						(Ins.)	±	1.		ENGIN	E		ELECT					REA	R	8±	
OPE	N MOI	DELS		CLOS	ED MO	DELS	2	(Ins.)	NAME		yls.	.)	b	515	TEM	Type	Make	l: Type	AXL	E	Service gencyff
2-3 Pass.	4-5 Pass.	6-7 Pass.	Spert Models	2-3 Pass.	4-5 Pass.	6-7 Pass.	Wheel Ba	Tire Size	MODEL	Make and Model	Ne. of C. Bore and Streke	Rating (N.A.A.C	Carburet	Generato and Stari Make	Ignition Make	Clutch: 7	Gearset:	Universal and Make	Type and Make	Gear Ratio	BRAKES.
\$3250 1895	\$3250 1395 (1895	\$3250 [1995	2145d	\$4300e 2395‡	1845 ∫2295	\$4700	132 119 123	33x5* 32x4* 32x4*	LaFayette LexingtonConcord Lexington,MinuteMan	Own Ansted-M Ansted-M	8-31/4x51/4 6-3-4x41/2 6-3-4x51/4	33.80 26.30 26.30	Johnson. Rayfield. Rayfield.	G-D	Conn	m-d Own s-p Long s-p Long	Warner	m Own f Snead f Snead.	F Std. 1/2F Salis 1/2F Salis	5 . 10	RLT1
1575 3800	1575 3800c	3800		{4600c		₹4900	117 136	32x4 33x5*	Liberty6-E Lincoln	Own	6-3½x5 8-3¾x5	23.44 36.45	Strom Strom	Wagner Delco	Wagner Delco	n-p B&B m-d Own	Detroit.	m Spicer	1/2F Tim	4.80	R1-T1
8600	7900	7900		\5200	11750 12200		142	35x5	LocomobileSeries 8	Own	6-4½x5½	48.60	Ball&B	West	Delco	m-d Own	Own	m Own	F Own		-
3095	(3095 2895	2895	2985a 2985e		3585 3985	4285§ 3985		32x41*	Marmon34	Own	6-3%x51/8	33.75	Strom	Delco	Doloo	m-d Own	Own	m Spicer	¾F Own	4.10	RLR:
875 2500	875 2500		975b 1045d	995	1195 1295 3000	1585d 1075d		31x4 32x41/6	Maxwell25	Own	4-35/8x41/2		Stewart			s-p Mech.					
5400	5600	5700		6720	6600e 6720	6810 6900§	127 140	33x5	McFarlanSV McFarlanTV	WiscY Own	6-33/8x5 6-41/2x6		Rayfield. Rayfield.	West	West	m-d Long m-d M&E.	Warner B-L	m Peters f Snead.	F Tim		
1395	1395	100	1595d	1785c	1795 1995		115	31x4*	Moen	Cont7 U	6-31/8x41/4		Strom		Delco	ер В&В		m Spicer			
	2150p 1095	1885	2095 f 1295d		2685	2585	128 113	32x41° 31x4°	MoonA	Cont7 U	6-33/8x41/2 6-31/8x41/4	27.34 23.44	Strom Strom	Delco Delco	Delco	в-р В&В в-р В&В	B-L Warner	m Spicer m Spicer	1/2F Tim	5.09 J 5.10	RLR2
1240	1240	1050g	1645e	2090с	{1640 2040	2040	121	33x4	Nash691-3-6-7	Own	6-3½x5		Marvel			в-р В&В		m Own	1/2F Own	4.50	RLT1
915	935	1390	1195e	1165	1445	2190	127 112	34x4½ 33x4	Nash692-4-5-8 Nash41-8	Own	6-31/4x5 4-33/8x5		Marvel Marvel	Delco	Delco Delco	s-p B&B s-p B&B	Own	m Own m Own	1∕2F Own 1∕2F Own	4.90 I 5.50	RLT1 RLT1
2475	2475c	2375 3150	2485d		3250 3725	3285	130	32x4½	NationalBB	Own	6-3½x5¼	29.40	Rayfield.	West	Delco	s-р В&В	B-L	m Univ	F Col.	4.08	R1-R2
995	995		1095a 1095d	1195	{1445 1395		113	31x4	Oakland6-54	Own	6-211x43/4					s-p Hoos		m Mech.			
785 495	795 495		915d 395g	985 750	1075 1135 795	655d	110	31x4 30x3½	Oldsmobile30 Overland91	Own	6-23/4x43/4 4-31/4x4	**	Zenith Tillotson	Delco		в-р В&В в-р В&В		f Own	⅓F Own ⅓F Own		
	695						106	30x31/2	Overland92	Own	4-3½x4	19.60	Tillotson	A-L	A-L	s-р В&В		m Own	12F Own	4.50	RLR2
2585 3850c	2585 3650	2350g 2785	2750e 2450g	3275e 4550e	3375 3625 f 4725	3450 3675 f d4700§	126 133	33x4½ 33x4½ 33x5	Packard126 Packard133	Own	6-33/8x5 6-33/8x5	27.34	Own	A-K	Delco	m-d Own m-d Own	Own	m Spicer	1/2F Own	4.66	F2.R2
30000	1795	3850 1795		d2395‡	4900 f (2595		136 143 131	33x5 33x44*	Packard	Own Own Cont.Spec.	8-33/8x5 8-33/8x5 6-33/4x5	36.45	Own	Dyneto.	Delco	m-d Own m-d Own m-d Long	Own	m Spicer	1/2F Own	4.70	F2-R2
,	(1995p	\1995p	,		\2770p																
1550 1985	1390 1985 2690	2750	1465d 2260g	2395d 3300	2395 2675 3390	∫3840	120 126 128	32x4½ 32x4⅓ 33x5*	Paterson23-6-52 Peerless	Cont8 R. Own Own	6-3\%x4\\\2 6-3\\2x5 8-3\\4x5	29.40	Johnson.	Delco	Delco	m-d Own	Own	m Spicer	1/2F Tim	4.66	F1_R2
5250	5250	5250		6800°	3690 6900	40908	138	33x5	Pierce-Arrow33	Own	6-4 x51/2					m-d Own m-d Own					
1745 2535	1695 2585	1745 2585d	1795c 2635d	2495‡	17000 f 2495	2645	126	32x4½	Pilot 6-56 Premier 6-D	H-S90	6-3½x5 6-3¾x5½	29.40	Tillotson	Wagner	Wagner	m-d Hoos	Muncie	f Good. m Blood.	3/F Col.	4.67 I	R2R1
2000	2300 1335	2350	2400c 1595d	3000d	3385 3050 1875	3585 3250 d2335‡	1263/4 124 120	32x41/2 32x41/2 32x4	R & V KnightH	Own Own.Kn'gt Own	6-3%x5½ 6-3½x4½ 6-33x5	27.34 29.40 24.34	Strom Strom	A-L N E	A-L	s-p B&B s-p B-L m-d Own	B-L	m Spicer m Spicer m fOwn	12F Tim	4.58 I 5.40 I	RI-R2 RLR2
3200e	3200		3200c		1985		131	32x4½	RevereM	Monsen, .4	4-43/8x6		Strom				B-L				
1645 2685	1595 2485	2685	2750c	2035 3285	2135 (3585 (3950§	(3585d	117 118	32x4* 32x4½	RickenbackerB Roamer6-54-E	Own Cont.12XD	6-31/8x43/4 6-31/2x51/4		Strom Strom			s-p Own s-p B&B	Own Fuller		34F Own 34F Tim		
(3685	3485	3800	3650e		4250p 4650p		138 128	32x4½ 32x4½	Roamer6-54-E Roamer4-75-E	Cont.12XD DueG1	6-3½x5¼ 4-4¼x6	29.40 28.90	Strom	West	Split Bosch	s-p B&B m-d B-L	Fuller B-L	f M&E. f M&E.	3/F Tim 3/F Tim	4.60 I 4.63 I	RLR2
11400	895 10900	11450	975	1175		12850	112 143½	31x51/4 33x5	Rellin		4-31/4x41/6 6-41/2x43/4	16.90		Dyneto	Conn	s-р В&В		f Snead.	1/2F Salis		F2.F2
1645 985	1645 985			2645d	2645	12900	136 112	33x5 31x4	Sayers SixGL Seneca50c & 51c	1	6-33/x5 4-35/x5	33.75	Strom	Deleo	Delco	s-p B&B	B-L	m Cle	F Tim	4.91 F 4.50 F	R1-R2
2750 540	2750 540	2750	2425g 640d	640	3585 785	3985 p935d	130 102	32x4½ 30x3½	Stanley740 Star	Own Cont. Spec.	2-4 x5 4-31/8x41/4 4-33/4x55/8	13.00 15.63	None Tillotson	Bijur A-L	None A-L	s-p B&B None s-p Own	None Warner	None m Spicer	14F Own	4 50 F	R1-R2
1750e 2395	1750 2395	1445g 2495	2195g	(3395 (3150p	2350 3395 3200‡	d2195‡ 3395	119 130	33x4 ¹ / ₂ 33x5	Stearns-KnightSKL4 Stearns-Knight6	Own. Kn'gt Own. Kn'gt	4-3 ³ / ₄ x5 ⁵ / ₈ 6-3 ¹ / ₄ x5	22.50 25.35	Schebler. Schebler.	A-L	A-K	s-p Own m-d Own m-d Own	Own	f Cli	1/2F Own 1/2F Own	4.50 F 4.70 F	R1-R2
1295	1295 1750	1595	1850c	1595d	1995	2250	117 124	32x4 33x4½	Stephens10 Stephens20	Own	6-31/4x41/2 6-31/4x41/2	25.35 25.35	Strom	Delco	Delco	8-p B&B 8-p B&B.	Mech	m Mech.	1/2F Tim	5.10 F 5.30 F	RLTI RLTI
	2150 1045 1425	895g	2250c	1195 1895d	2800 1485 1985	c2750‡ 1395d	125 112 119	32x4½ 31x4 32x4	Studebaker . Light Six Studebaker . Spec'l Six	Own Kn'et	6-31/4x45/8 6-31/4x41/9	23.44	Strom	West	West	m-d Fuller.	Own	f Clim	1/2F Own	5.00 I	R1-R2
1450g 1995	1835d 1995	1750	2265d	10000	2495 2550	2685	126 120	33x41/2 32x41/2	StudebakerBig Six	Own Weid	6-3½x5 6-3½x5 6-3¾x5	36 04	Rall&R	Wag-R	Wag-R	s-p Own s-p Own	Own I	m Snicer	Lar Own	3.7111	Ki-Ka
	2790 2650	2640 2685	3115d	3250d 3600 f	2990 3350	3500	130 130	32x4½ 32x4¾	Stutz	Own	4-43/8x6 6-31/2x5	30.63 29.40	Strom Strom	Remy	Delco Remy	s-p B&B m-d War s-p B&B.	Own Warner	m Hart m Univ	F Own	3.75 I 4.66 I	R2-R2
	1895		1995d	2495‡	2595		122	33x4	Templar	Own	6-33/8x5					:	Warner		34F Salis		
1275	1095 1275		(1525b	1845d		d1945‡	118 118	32x4* 32x4*	Velie	Own Own	6-3 1 x 4 1/4 6-3 1 x 4 1/4	24.38 24.38	Strom	West	A-K A-K	*-p Dool *-p Dool	Durston. Durston.	m Thie	1/2F Own 1/2F Own	4.00 F	१1-Rभ १1-Rभ
	1690	1990	1565d 2190 f 1840d	1815d	(2095p) (1815) (1965)	d2290‡	125 120	32x4½ 32x4¾*	Westcett48 Westcett44	Cont. 12 X	6-3½x5¼ 6-3¾x4½				1	s-p B&B s-p B&B				1	
2575	2475			32750	2090 ∫3575	3475	121	32x41* 32x6	Westcett60 Wills Ste. Claire A-68	Own	6-314x5 8-314x4		1		- 1	s-p M&E. m-d Own					
2875	2675	2675	2875		33751	3800	127	32x6		Own	8-31/4x4					m-d Own	1			1	
1175	1195		1635e	1550e 1635d	3800 1895p		118	32x4	Willys-Knight64							m-d Own					
		1325		(10330		1995	124	32x41/2	Willys-Knight67	Own. Kn'gt	4-3%x4½					m-d Own					

1924 (first three months) 21,749 Cars



Talk About Sales!

There's great satisfaction in dealing with cold facts—quote the figures, and they speak for themselves.

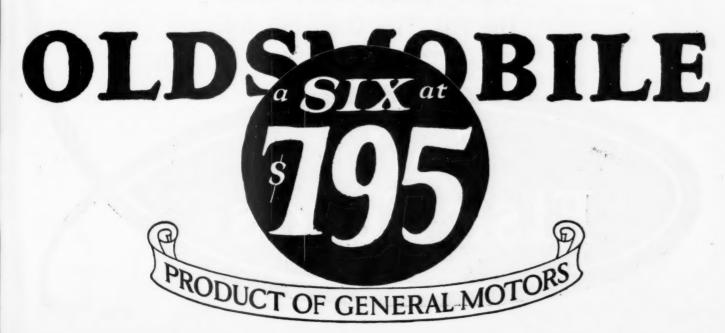
Our dealers are enjoying the finest business they have ever had. Sales for the first three months of this year have totalled 21,749 Oldsmobile Six cars. (That's 5929 in January,

7220 in February and 8600 in March). This is in contrast to the same period of 1923, with a total of 7,635 cars.

What will our dealers do in April, May, June and the rest of 1924? Figure it out for yourself.

How would you like to be an Oldsmobile dealer? Possibly we have an opening for you.

OLDS MOTOR WORKS, LANSING, MICHIGAN Olds Motor Works of Canada, Ltd., Oshawa, Ont.



RATION SELECTION OF SELECTION O

1924

58 R-R²
50 R-R²
10 R-R²
60 R-T¹
10 R-T¹
75 R-R²

90 R1-T1 50 R1-T1 08 R1-R2 70 F1-T1 10 R1-T1 50 R1-R2

50 R-T

66 F2-R3
66 F2-R3
70 F2-R3
70 F2-R3
60 R1-R3
50 R1-R3
66 F1-R3
90 R1-R3

70 RLR²
44 RLR²
60 F2-T1
60
60 RLR²
63 RLR²

60 R1-R3

5 R1-R2 6 R1-T1 7 R1-T1 7 F1-R2 7 F1-R2 15 F1-R2 14 R1-R2

When it's Time to Re-tire Get a Fisk Trade Mark Reg. U. S. Pat. Off.

A Way To Steadily Increase Your Business



A FTER all the only business that enjoys a steady increase is the one founded on the most important of all principles of success—SELL MERCHANDISE WITH AN ESTABLISHED REPUTATION FOR QUALITY AND PERFORMANCE.

Because—Your customers will instantly regard you as a reputable merchant—one in whom they can place confidence. And confidence plays a greater part in selling tires than most any other business.

Because—A quality product always builds repeat business. Your old customers come back because they learn from their own experience that quality costs less in the end. Furthermore, satisfied customers are your best salesmen.

Fisk Cords Are Quality Tires

With a solid reputation for long, uninterrupted low-cost mileage, that only highest quality makes possible, Fisk Cords offer the greatest business building tire today.

Let Fisk Cords build a steadily increasing business for you.

The Fisk Tire Company, Inc. Chicopee Falls, Mass.

Sell Fisk Cords

Coast to Coast

in Gardner Sedan in Dead of Winter



Official start midwinter transcontinental run. Sidney Bowman of New York is bidding "Cannon Ball" Baker goodbye. Group to left includes official observers.



"Cannon Ball" Baker and stock Gardner Sedan at Los Angeles,

Cannon Ball Baker Makes record run New York to Los Angeles

3,398 miles in 4 days, 14 hours, 15 minutes!

The First Midwinter Transcontinental Speed and Endurance Run Ever Made in a Stock Closed Car. Only One Car Used

The most convincing advertisement ever published for the Gardner car was written by "Cannon Ball" Baker on the rut-torn roads from New York to Los Angeles in a stock Gardner Sedan in the dead of winter. With weather conditions at their worst, he drove 3,398 miles across the continent in 4 days, 14 hours, 15 minutes!

From ocean to ocean at an average speed only 4 miles an hour less than is possible with the most direct railroads and fastest trains.

1,396 miles of the trip was made on chains.

Only one car was used throughout the entire trip, and all driving was done by "Cannon Ball" Baker himself.

"The flow of power in that car was amazing," said this noted driver, as he slipped from behind the wheel of the Gardner at Los Angeles. "It was smooth and even and seemed

endless. The motor hummed beautifully all the way. At no time were we pulled to the limit."

Then, to cap the climax, he drove the same stock Gardner Sedan at a speed of 64 miles an hour over the Los Angeles Speedway. He carried three passengers and was timed by four stop watches.

The Gardner's record midwinter transcontinental run has opened the eyes of all America to the ruggedness and amazing performance qualities of the Gardner. It has given added impetus to Gardner sales. And Gardner dealers are reaping the harvest.

Think what you could do with the Gardner in your town.

Write or wire for details of the Gardner contract.

The Gardner Motor Company, Inc., St. Louis, U. S. A. Builders of Vehicles Since 1882

GARDNER



Practical Talks to Service Men

CVERY automobile service man wants to be fully informed. To

be up to date is part of his stock in trade. With the rapidly increasing

use of Watson Stabilators, you will

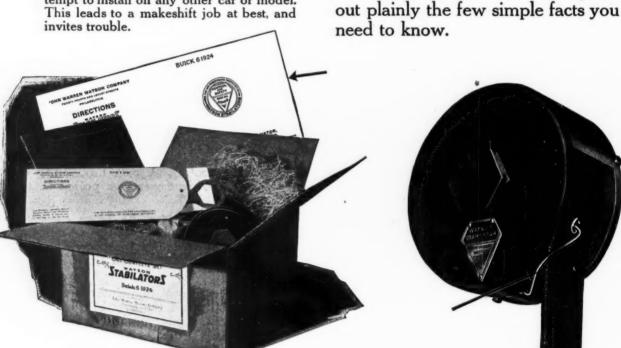
want to know how to install them,

and adjust them if necessary. In this

series of practical talks, we will point

Each set of Stabilators is packed complete in a carton like this. The fittings are accurately designed to make a workmanlike job of each attachment. Each set tailor-made for a particular car. Hence, each set varies to suit variations in car chasses.

The label on the carton tells what car and model the set is intended for. Do not attempt to install on any other car or model. This leads to a makeshift job at best, and



In each carton you will find an envelope containing a drawing. This shows exactly how to install that particular set. Study the drawing carefully before you start work.

Where holes are called for, locate them exactly as instructed. Wherever possible existing holes are used. Do not try to use holes already in the frame if the drawing calls for a different location. Remember, our engineers have made a study of each frame and would have used existing holes if this had been advisable.



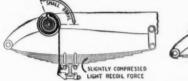
Every Stabilator is correctly adjusted be-fore leaving the factory. The strap is temporarily held in its proper position by the locking wire shown in the illustra-tion. The locking wire should be left in place until the installation is entirely completed.

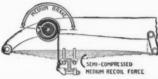
Do not pull on the strap or even lift the Stabilator by it. A very slight pull will release the locking wire and destroy the factory set-up.

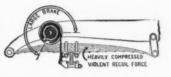
Stabilators are—

brakes to hold the car down against spring recoil. The car springs protect the car and passengers from the bumps and Stabilators protect the car and passengers from the rebound of the bump-compressed springs.

Stabilators automatically set themselves to resist *rebound*, varying their resistance in proportion to the rebound force, as shown here:







There is only one wearing part — the brake shoe, which revolves about a steel drum. The strap is not subjected to wear.

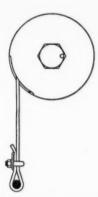
There are no bearings; no oil or grease is needed. In fact, lubrication is harmful.

Stabilators do not grow weaker in use.

JOHN WARREN WATSON COMPANY, PHILADELPHIA
TWENTY-FOURTH AND LOCUST STREETS

STABILATORS

Change the Whole Nature of Your Car



After attaching the Stabilator to the frame and the axle bracket to the axle, carry the strap down around the axle bracket as shown, drawing the strap taut, and setting the clamp tight. Notice that the plate must be on the short end of the strap with its biting edge up. Be careful not to leave any slack in the loop around the bracket or elsewhere. The adjustment is set for tight installation.

Final Inspection After removing the locking wires, rock—the car on the springs so as to work the Stabilators. Then see whether the straps are clearing on each side of the opening and pulling in line with the brake shoe as shown. The straps are not wearing parts and will last indefinitely if brackets are properly lined up. Correct bad alignment by shifting axle bracket.

Also turn steering wheel as far as it will go each way and make sure there is no interference with drag link or tires.

After the Stabilators have been installed for a time, the eyelet in each strap should be on the horizontal center line of the Stabilator when the car is standing level with no passengers. Notice that the locking wires hold the eyelets below center. This is to allow for the final stretch of the strap. Check up on this eyelet position after car has been driven 500 miles.

Read the booklet enclosed in envelope for instructions for readjusting if ever necessary.

WARNING Never oil or grease Stabilators. They have no bearings, and oil or grease will ruin their action. If you want detailed instructions for installation on any particular car for your files, we will be glad to mail them to you upon request and to answer any questions. Specify car make and model and year.

Further interesting data will appear in subsequent issues



DURANT STAR FLINT SIX ROADKING SPEED TRUCK

VERY Durant Product provides a big opportunity for men who know how to merchandise cars. Good merchandisers in the passenger car and speed truck business are meeting with great success with the Durant Products listed above.

Send for a description of each line—a money-making territory near you may be open.

DURANT MOTORS, INC.

Sales Promotion Division Long Island City, N. Y.

Manufacturing and Assembly Plants in:

ELIZABETH, N.

OAKLAND, CALIF.

MUNCIE, IND

LONG ISLAND CITY, N. Y



And Now We Are Sendig Them in to Buy



Cooper Dash Control

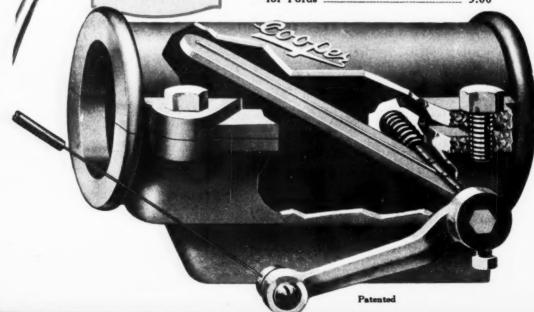
Gives ideal control of Cooper Cut-out—also for operation of Choke, Radiator shutter, Heater value, etc. A twist of wrist locks it in any position—an exclusive Cooper feature. Brass, hand-somely nickeled. Beautiful, durable, convenient. Installation requires only half inch hole.

Price \$2.50.

Made for all Makes of Cars

Prices of Valve Only

13/4, 13/8	2½ 4, 2¾, 2½, 2½ 4, 2½, 3 levrolet Special lepper Valve, Complete with pedal
	evrolet Special



Sales pressurong backing we're giviper (

You'll cash iton of campaign. We're hisperit, in Big Smashis, at SATURDAY E'G F booster in the wolenty that will send motight it

Be prepared! by C your store. Chec stock ucts. If you're chaves jobber quick. Se Cou Do It NOW! It extra

Motor experts here like the Cooper. now installed easily will vering the Exhaust when installed, iways that because of extra heavy sprin and fivents chattering, is non-clogging, durways

COOPER G



A Huge Profit Maker VE DEA

Everywhere

OKOMO Windshield Wings, standardized in design and attachment to fit all cars, offer you an unbeatable money-making opportunity.

money-making opportunity.

Every owner of an open car is in the market for Kokomo protection and the "class" it adds to the car. No other Wings have so many desirable and exclusive features. No others are so easy to sell, afford such values, satisfy so thoroughly.

Outstanding among Kokomo patented features is the Frictiongrip locking-device. Operated by a simple and easily turned Hand Grip Nut, it enables the driver to adjust and lock the wings securely in any position, do it instantly—and without use of any tools whatever. No other wings have this convenience or any satisfactory substitute for it.

Other exclusive features are especially designed Glass and Uni-

Other exclusive features are especially designed Glass and Universal Clamp. Glass, in four different lengths and standardized in width and in pattern, is made to fit all models of cars. Clamps holding them in fit all standard windshield posts. No other line offers you this tremendously valuable fit-all-car feature. Means quick easy installation-affords maximum sales from a minimum stock.

Kokomo Wings are made of highest grade polished plate glass with beveled edges and mountings of nickeled brass of our own exclusive and more practical design. They are the wings that dominate all over the world. Because unequalled in QUALITY, Kokomo Products are standard equipment on special models of Anderson, Apperson, Auburn, Buick, Case, Chrysler, Dort, Franklin, Durant, Haynes, Nash, Oldsmobile, Packard, Reo, Revere, Sterling Knight, Stephens, Duryen, Velic, and Winten.

lin, Durant, Haynes, Nash, Oldsmobile, Packard, Reo, Revere, Sterling Knight, Stephens, Duryea, Velie and Winton.
Sell this well-known and established quality line. Order Ko-komo Wings and Mirrors from your jobber today. Display Ko-komos. Send coupon for our sales and profit proposition.

Manufactured by KOKOMO AUTOMOTIVE MFG. CO.

Kokomo, Ind. Exclusive Sales Representatives

THE FULTON CO.

Milwaukee, Wis.



Prices of Wings

Kokomo Wings-	-F	ine	st I	Ma	de			\$22.50
Eagle Wings .								17.50
Hoosier Wings								

Kokomo Mirrors



Prices \$1.35 to \$3.00. Write for details.

KUMA

6	TOTAL 2000 00	R FREE	1233		600 (180 E		M 363	1000	5980		963	0800			nin.				SIM	629	1000		100		-
	KOK	OMO	OA	U	TO!	MO	TI	VE	MF	G.	CC).,	Ko	kon	no,	Ind										
		Gen	tle	mei	n:	Ple	ease	rus	h fu	ll d	leta	ils	of I	Kok	omo	De	eale	r P	rop	osit	ion	an	d S	Sales	P	lan.
ı	Name																							-		
1	Addre	:88																								
8	City_														S	tate	e									
В,	000 MM 400			ESS E	2002 0	ma 1	SSID I	-		me	-	-	-	-	-	-	-	-	-	-	-		-	-	200	-



THE 100% LUBRICANTS

Guaranteed not to cake or harden or to contain any moisture—mineral or fatty acids.

Manufactured expressly for use in Alemite or any lubricating system. An ideal lubricant for chassis, transmission or differential lubrication.

Recommended and adopted by roller bearing and axle manufacturers.

Attractive Proposition For Jobbers And Dealers

THE RADIANT OIL CO., Inc.

(OHIO)

LIMA, OHIO

Manufacturers and Compounders

DU PONT ANNOUNCES AN ENTIRELY NEW TYPE OF FIN



Duco is adaptable to almost any product requiring a lasting finish in color. It is already being successfully used in the following industries:

Automobile Bodies Truck Bodies Automobile Accessories Metal Furniture Office Equipment Pens, Pencils, etc. Washing Machines Lamps Handles for Tools, Brooms, Brushes, etc.

Novelties Toys Electrical Parts Umbrella and Cane Handles Radio Boxes and Radio Parts Gasoline and Oil Pumps Bath Fixtures and Accessories Medicine Cabinets, etc. Toilet Seats Typewriters mum Cleaners

VISCOLAC-

The transparent finish, without color, for use on furniture and other wooden articles where a natural finish of superior durability is desired.

GREATEST ADVANCE IN FINISHING ART IN **QUARTER-CENTURY**

Duco Finish Gives to Wood or Metal a Rich, Satin-like Surface Whose Soft **Lustre Actually Improves With Age**

Chemists have long sought the secret of a finish which would combine two essentially different properties—beauty and permanence. After years of research, thousands of experiments, and exhaustive service tests, du Pont Chemical Engineers now announce the perfection of just such a finish—and its adaptation to quantity production and quantity application. This new finish is known as Duco.

Duco can best be described by likening it to the finishes which gave to ancient Chinese lacquerware and costly Oriental pottery the soft, rich tones which have come down unmarred through the ages. The effects marred through the ages. The effects which the ancient artisans required months to produce on a few rare objects are now being duplicated in a few days' time on thousands of articles in commercial use with Duco.

Amazingly Durable!

Applied to almost every material, from wood to steel, Duco defies the usual deteriorating elements. Its soft lustre actually improves with age. It retains its original color tones and values, and even bumps and scratches, which would disfigure other finishes, do not seriously affect it.

Duco is, in brief, of such extraordinary denseness, hardness and adhesiveness, that it forms a surface on the material it covers, which sets an entirely new standard of durability.

The finish on an automobile, for The finish on an automobile, for example, is subjected to action of sun, rain, snow, ice, mud, alkali dust, grease, boiling and freezing temperatures and sudden changes. Yet test cars finished with Duco over a year ago are today actually in better condition than when the finish was applied. Duco is today giving equally successful results in 20 other industries.

Rich Tones That Last!

Rich Tones That Last!

Organically, Duco represents an entirely new type of material. It is compounded on a pyroxylin base, employing a distinctly new principle. It is supplied both in a basic black, and a wide variety of beautiful fast colors, suitable for finishing practically all types of wood and metal surfaces. Neither the black nor the colored enamel finish requires baking. Duco retains its original colors indefinitely.

Duco is easily applied by dipping or spraying, but cannot be applied by brushing. It dries almost immediately after application, thus materially reducing finishing time and costs.

Manufacturers of all products which require a colored finish of enduring beauty are invited to investigate

beauty are invited to investigate Duco. Our Technical Laboratories are at their disposal. Our representatives are available for a limited number of demonstrations.

E. I. du Pont de Nemours & Co., Inc. Chemical Products Division Parlin, N. J.



YOUR CUSTOMERS WILL READ THIS ADVERTISEMENT

You Should Know the Facts About Duco

Have you read the smashing announcement on the opposite page?

This advertisement appears in The Saturday Evening Post for March 29th. It will be followed by other direct appeals to the imagination and self-interest of the great army of American car owners.

In this advertising the plain facts about Duco Finish are so startling they are hard to believe. But once let a motorist get hold of a Duco-finished car—he will prove every one of them himself—up to the hilt.

Literally, Duco is taking the country by storm—manufacturers, dealers, refinishers, owners. Once they know what it will do and stand, they all want it—as quick as they can get it.

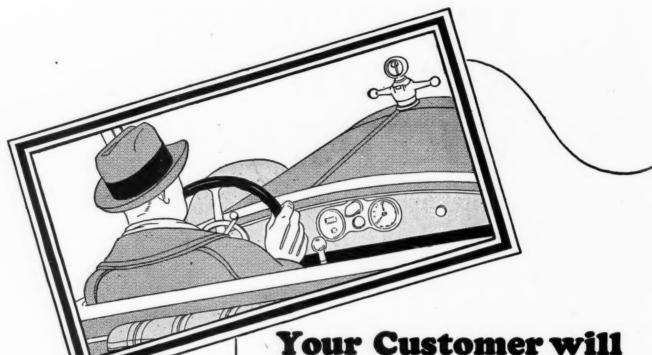
Every 1924 Oakland car is now Duco-finished. The Oakland Company considers the new finish such a decided advantage that it is also advertising Duco extensively. Several other of the large auto manufacturers are now using this new product. A dozen more are arranging to do so. Refinishers everywhere are rapidly equipping to supply this new finish exclusively.

Think of it! A finish waterproof, weatherproof—that stands practically any abuse and actually improves with age! Who wouldn't want it?

E. I. DU PONT DE NEMOURS & CO., INC.

Chemical Products Division PARLIN, N. J.





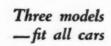
Your Customer will always remember You

—if you sell him a KEYSTONE. It is right in front of him every time and all the time he drives—and it looks so good on his car that he will always remember gratefully the man who sold it to him. A KEYSTONE will always make friends.

Self-locking. No installation—just screw it on to the radiator neck—no keys or set screws. Permanently theft-proof because they are absolutely rust-proof and will not stick or "freeze."

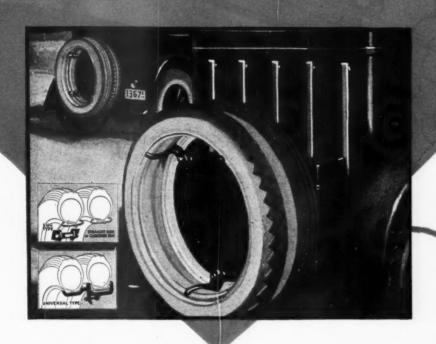


THE NORLIPP COMPANY
568 W. Congress St.
CHICAGO



Ask your distributor for dealer's proposition—also window displays, counter cards, pedestals and literature, or write us

Push Items That "Multiply"!



STONE TIRE CARRIERS

Selling a Stone Tire Carrier opens the way logically for the sale of an extra tire, rim and tube. And selling the Stone Tire Carrier to every class of customer is not difficult.

Three sturdy units lock tight to the "regular" spare, allowing double protection, minus rattle or chafing. No ropes or straps. No interference with the covers, tail light or license plate. Quick on or off. Silver finished, of electro-galvanized malleable iron. Fits all cars, including balloon three equipped. Stone Tire Carriers have a quick appeal for motorists who want the standard item.

Universal type—for $3\frac{1}{2}$ in., 4 in., and $4\frac{1}{2}$ in. S. S. rims, \$3.00 per set; Ford clinchers \$2.50 per set; Lug type, \$1.00 per set.



Stone Rims and Rim Parts

Stone Rims are standard for every car. Stone Rim Parts—lugs, bolts and nuts—fit every car, and are perfectly adapted for quick, easy sale.

To Sell-Display

Displaying the goods is the first law of profitable merchandising. So we have devised the Stone Rim Display Rack, Rim Parts Cabinet and Rim Parts Display Board. We will send you the Cabinet or Board FREE when you order a rim parts assortment.

Write your jobber NOW for assortments and prices

The Stone Manufacturing Co.

1502 South Michigan Avenue, Chicago 135 Wooster St., New York







TIMES—in the tire industry—have changed with startling rapidity since Murray Tires came into being three years ago. One day a "Quality Market"—the next day a "Price Market." No wonder many dealers know not which way to turn.

But those dealers who have enlisted under the Murray Banner have always been safe. From the first they have been "tires of the times," a QUALITY product always, but, through the elimination of unnecessary expense and burdensome overhead, sold to the dealer at a price enabling him to meet any competition or market.

Write for our exclusive dealer's proposition. Be the sole distributor in your community for this Quality Tire. We will be glad to discuss our distribution plan and show you how we can sell such a good tire at such a reasonable price.

Murray Rubber Company Trenton, N. J.

Marc



WHEN WE SAY that the Kingston Vacuum Fuel Feeding System is a new and better development in fuel feeding and oil circulation and lubrication, we are not quoting our own opinion merely, for a number of America's great motor car manufacturers have already adopted Oil-Vac as standard equipment. These men know.

We want every motorist to know these things of Oil-Vac! The vacuum is produced by the circulating flow of oil. This means that the vacuum increases with the speed of the motor; in other words, as the need for more fuel arises, that is supplied. Every motorist will realize the value of sustained power when it is most needed—on long grades, in rough going, and among the hills. The best qualities of Oil-Vac develop in the emergencies.

Cars Oil-Vac equipped run cooler, and lubricate better. The oil is constantly aerated, lubrication is much improved, and crank case dilution is at a minimum. The whole secret of the perfect operation of Oil-Vac is harmony—The flow of oil is in exact relation with the speed of the car, and in turn it controls the vacuum which determines the volume of fuel used. Oil-Vac means better lubrication, more power and smoother notors

Men Who Design, Manufacture or Sell Automobiles Are Urged to Write for the Oil-Vac Booklet.

BYRNE, KINGSTON & CO. KOKOMO, INDIANA, U. S. A.

BRANCHES

New York, Chicago, Detroit, Atlanta, Dallas, Los Angeles

"Oil-Vac"

This Free Merchandiser Speeds Up Sales

This is our gift to Rose Dealers in the interest of big-ger sales and better business.

An attention catcher and sales stimulator that is free to you with the purchase of the goods it displays.

It is a proven success. Dealers tell us they are selling more Rose Equipment since they got their free Merchan-

diser than ever before.

It catches the eye and "asks 'em to buy." It puts the goods out where folks are free to look it over and examine it. It does



Ask Your Jobber About It

Marc

The Standard Spark Plug of the World

> More than 85 per cent of all cars and trucks produced in this country, Fords excluded, are factory equipped with AC Spark Plugs. Among these cars are:

Buick Hupmobile Cadillac Jewett Chalmers Jordan Chandler LaFayette Chevrolet Marmon Chrysler Six Maxwell Cleveland Nash **Dodge Brothers** Oakland Dort Oldsmobile Durant Paige Peerless Six Star Yellow Cab Hudson

This tremendous, ready-made market for AC's is right at your door and will always be there in ever-increasing size.

There is a type and size for every motor

AC Spark Plugs are a safe investment. They are backed up by the factory

equipment business of more than 200 manufacturers, and by strong national

advertising.

Consequently there is always a big demand for them not only from the owners of AC-equipped cars but from the owners of other makes as well.

AC's are the best known, the easiest selling and most profitable spark plugs to stock.

The AC 1075 for Fords is a big seller because it is a better plug for Ford engines—it satisfies the owner and makes money for the dealer.

SPARK PLUGS Speedometers

The accurate, easily installed Ford Speedometer can be sold to every Ford owner

AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs-AC Speedometers U. S. Pat, No. 1,135,727, April 13, 1915. U. S. Pat. No. 1,216,139, Feb. 13, 1917 Other Patents Pending Arrow Head
Pistons
Piston Pins
Axleand Drive Shafts



Dependable Products

ARROW HEAD STEEL PRODUCTS CO. MINNEAPOLIS, MINN., U.S.A.

Marc

By replacing ordinary case hardened bearings with thoroughly heat treated FAFNIR BALL BEARINGS, the passenger car or truck owner may confidently expect a length of life equal to that of the car.

Distributors of FAFNIR BALL BEARINGS will render you prompt service.

DISTRIBUTORS

Albany, N. Y., 108 Central Av., The Fafnir Bear'g Co. Ardmore, Okla., Anderson's Auto Salvage Atlanta, Ga., 375 Edgewood Av., Southern Bearing Co. Baltimore, Md., The Motor Parts Corporation Baltimore, Md., The Motor Parts Corporation
Billings, Montana, Hines Motor Supply Co.
Birmingham, Ala., 303 S. 20th St., Southern Bear'g Co.
Brooklyn, N. Y., 560 St. Marks Av., P. J. Treiber Co.
Butte, Mont., 25 E. Galina St., Butte Automobile Co.
Camden, N. J., 1131-33 Federal St., Commercial Motors
and Parts Co.
Casper, Wyo, The Wyoming Automotive Co.
Cleveland, O., E. 22nd and Chester Av., Cleveland

Ignition Co.

Ignition Co.
Cleveland, O., 6537 Euclid Av., Ohio Ball Bearing Co.
Columbia, S. C., 1220 Hampton Av., E. A. Jenkins
Cushing, Okla., O. K. Vulcanizing Co.
Davenport, Iowa, 500-516 Iowa St., Sieg Company
Denver, Col., 1725 California St., M. L. Foss
Des Moines, Iowa, 506 W. 7th St., Bernhard & Turner
Automobile Co.
Detroit Mich. 91-109 Selden Ave. Auto Electric and

Detroit, Mich., 91-109 Selden Ave., Auto Electric and Service Corp.
Detroit, Mich., 3958 Cass Av., The Detroit Ball Bearing Co.

Duluth, Minn., 403 E. Superior St., Duluth Bearings and Parts Co.
El Paso, Tex., 315 E. Missouri, West. Btty. & Mag. Co.

Guthrie, Okla., Getlack Bros.
Hagerstown, Md., Ludwig Tire and Accessories Co.
Hartford, Conn., 229 High St., Kenyon Bear. Co., Inc.
Jacksonville, Fla., 117 Cedar St., Welder's Supply Co.
Johnstown, Pa., Johnstown Bearing & Supply Co.
Lancaster, Pa., 44-46 N. Queen St., Reilly Bros. &

Raub.

Raub.
Little Rock, Ark., 3rd & Cumberland Sts., Crow-Burlingame Co.
Los Angeles, Cal., 415 W. Pico St., The Pacific Ball Bearing Company
Macon, Ga., 2d & Poplar Sts., A. S. Hatcher Company
Minneapolis, Minn., Wilcox Trux, Inc.
Modesto, Cal., 826 9th St., Stanislaus Auto Supply Co.
Nashville, Tenn., 620 Commerce St., Auto. Bearing Co.
Newark, N. J., 271 Central Ave., The Fafnir Bearing
Co., Newark Office
New Hayen, Conn., 294 York St., Conn. Bearing Co.

New Haven, Conn., 294 York St., Conn. Bearing Co. New York, N. Y., Rm. 206-7, 5 Columbus Circle, The Fafnir Bearing Co., New York Office
Norfolk, Va., 217 Bank St., Norfolk Motor Equip.

Corp. Oklahoma City, Okla., 406 N. Broadway, Sharp Auto Supply Co.

Supply Co.

Philadelphia, Pa., 1427 Fairmount Av., The Fafnir
Bearing Co., Philadelphia Office

Phoenix, Ariz., 3rd Av. & Washington St., Phoenix
Auto Supply Co.

Raleigh, N. C., 10 E. Davie St., Motor B'r'g & Parts

Co.

Rawlins, Wyoming, Rawlins Motor Co.
Sacramento, Cal., 916 12th St., Henderson Bros.
San Francisco, Cal., 53-57 California St., The
F. Somers Peterson Company
Santa Rosa, Cal., 414-416 Mendocino Av., Battery
Shop

Shop

Sheboygan, Wis., 606-8 N. 8th St., Acker Electrical Stockton, Cal., 228 N. El Dorado St., W. L. Maxwell

Syracuse, N. Y., 143-145 Seymour St., Burr-Fowler Co. Tampa, Fla., 309-11 Washington St., Wholesale Auto Supply House of Tampa Toronto, Can., 557A Yonge St., Auto Starter & Gen-

erator Repair Co. Tucson, Ariz., 6th Ave. & Bway, Vasey Rubber Co. Washington, D. C., 1335 14th St., N. W., F. E. Phelps.

FAFNIR BEARING CO.

New Britain, Conn.

CHICAGO, ILL. 537 South Dearborn St. DETROIT, MICH. 120 Madison Ave., Rm. 511 CLEVELAND, OHIO 1016-1017 Swetland Bldg. NEW YORK, N. Y. 5 Columbus Circle

NEWARK, N. J. 271 Central Ave. PHILADELPHIA, PA. 1427 Fairmont Ave.





Now Made

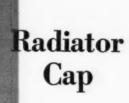
for

Fords

and

Chevrolets.

Too!



A question You will be asked many times this Season

"Do you carry the Bethlehem De Luxe Radiator Cap?"

Every car owner in America is in the market for a Radiator Cap that is thief-proof, convenient to handle, distinctive looking and inexpensive. That's the Bethlehem De Luxe! It is the only radiator cap that combines massive, beautiful appearance with convenient SERVICE!

Made with a handsome initial or emblem, to fit 102 makes of carsfrom Ford to Rolls-Royce! See how completely it covers the market? And Bethlehem advertising in national publications will make them easy for you to sell!

Just read these real selling arguments! The De Luxe is a hinged cap with monogram latch. It locks the Motometer or emblem to the car by sealing the threads. Once on, it can't be removed except with shop tools. No turning cap to fill-no scorched fingers. Just snap top open and click

The De Luxe cap is a real help in selling Motometers or ornaments and it brings a mighty handsome profit when sold alone. Car dealers add to the attractiveness of their show-room models with Bethlehem De Luxe Radiator Caps. Start profits coming your way by writing for our discount sheet—TODAX.

De Luxe Cap for Fords. Gray and others \$3.75.

Chevrolet, Star, Oldsmo-bile Six, Es-sex, Overland others. \$4.00

For other larger cars \$5.50

Inswer it with the Goods!

Company of the Goods!

Company of the Goods!

Company of the Goods!

BETHLEHEM SPARK PLUG CO., Incorporated BETHLEHEM, PA.

Mare



John N. Willys Was an Automobile Dealer Himself

He found out by actual contact what the people want in motor cars. He found out exactly the kind of support and co-operation dealers need and should have from the manufacturer.

Willys-Overland merchants are making money—real money! The merchandise they sell is right—the greatest Overland and Willys-Knight cars ever built. Unparalleled public demand has followed a wide realization of the great dollar-for-dollar value in these fine cars.

But any Willys-Overland merchant will tell you another reason for their great success. They are being treated with great consideration and fairness by the factory. Every factory policy is pointed to their well-being and success.

WILLYS-

Witness these instructions written long since by John N. Willys himself in his confidential instructions to wholesale representatives:

"Play 50-50 with the dealer. Don't hound him to death. Don't load him with cars until he can't call his soul his own. Don't sign him for more cars than you know he can sell. Don't sell him one model, then ship him another. Don't ride a carload in to the dealer without an order. Don't drive—LEAD!"

Success is inevitable when good cars are backed by such a policy. Many a man is a successful Willys-Overland merchant today who was a mechanic a year or so ago. Some of them didn't even know they could sell. A lot of them have literally made fortunes with little capital, some hard work and the vast popularity of the cars they sell.

Take your own measure. See if the coat of success fits you. Willys-Overland merchants, who already know the difference between this opportunity and any other, have written a remarkable book—"Evidence"—just off the press. Get it and check your opportunity against the accomplishments of these men.

"Evidence" will show you better than anyone can tell you what the future can hold for you. Send for it today!

Dept. R WILLYS-OVERLAND, Inc., Toledo, Ohio Willys-Overland Sales Co. Ltd., Toronto, Canada



OVERLAND

Known to the Trade for Years -Used by the Trade for Years

Universal Hose Clamps are first, last and always—quality clamps.

They have not been sacrificed to the "make-'em, sell-'em fast" bugaboo. They are produced in vast quantities but retain every part of their original quality-and always will.

For this reason-and for no other-the industry has placed on them its stamp of approval.

One size-1 to 3 inches-is adjustable to fit any hose of any size. We also make a clamp called "Junior" which satisfies the occasional needs of small hose $\frac{1}{4}$ to $1\frac{1}{2}$ inches.

Specify Universal Hose Clamps—insist on the genuine - get your money's worth-get satisfaction and give satisfaction.

> Universal Industrial Corp. Hackensack, N. J.



The Universal Hose Clamp has a smooth edge—no metal parts project to catch in the fingers—it cannot cut or injure the hose—it is Electro-Galvanized, not HEAT galvanized—the clamp, bolt and nut cannot rust.

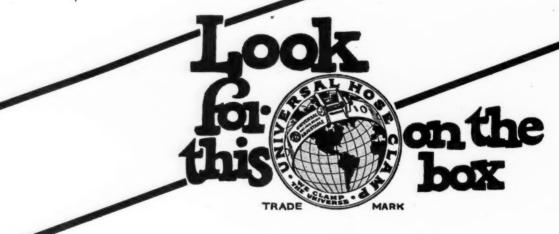
Its patented "bead" creates a pressure so tight that a leak is impossible.

Its scores between holes cause a clean, quick break-off. It is made from steel ribbons—cold rolled from wire.

The trade accepted Universal Hose Clamps from the very beginning because they supplied the trade with what it was looking for-a good clamp dependable in every way.

Department of Sales
CHICAGO PHILADELPHIA
F. C. West Corp. 7. Scott Eavenson
1536 Cherry Street BOSTON Burton Rogers Co. 26 Brighton Ave.

DALLAS Henry Knight 2218 Commerce



Patents Granted March 20, 1917 March 1, 1921

Adjustable to fit any hose of any size

Tremendous Increase In Enamelling of Bodies

POUR years ago just two motor car makers were putting a baked-enamel finish on their cars. Even certain of their models were being painted in the oldfashioned way.

Now eight of the leading makers are enamelling practically their entire production. Most of these have taken this progressive step only within the past 18 months.

"Today" the use of baked enamel is the mark of leadership—"tomorrow," perhaps within a year or two, other makers may be forced into line by public opinion. Enamelling is coming into its own—and with a rush.

Naturally, not all of the present enamelling is properly done. Some makers have compromised the results by using materials not exactly fitted to the purpose, too low temperatures and by slighting the pre-treatment of wooden parts. But, since all except the poorest baked enamel finish is so far ahead of even the best (production) painting, the trade and public are rapidly learning and demanding the advantages.

The engineers of the Oxford Varnish Corporation after introducing the baking of fenders some twelve years ago, worked constantly to perfect a method of baking the finish on an entire body.

Their success in perfecting the Oxvar Method is now well known.

Its use in big production for over four years shows:

- (1) That it costs less than 1/2 of average paint finishing.
- (2) That it gives a "nail" hard, high-gloss finish which lasts as long as the car.
- (3) That a body can be completely done in about 7½ hours.
- (4) That the pre-treatment given to wooden parts protects them permanently against swelling, warping, splitting and squeaking.

Only the "Oxvar Method" gives all these benefits. We urge motor car and body manufacturers not to suffer by comparison with enamelled "jobs"; not to use compromise methods; not to spend money in needless experimentation. The Oxvar staff will cooperate with you, without obligation.

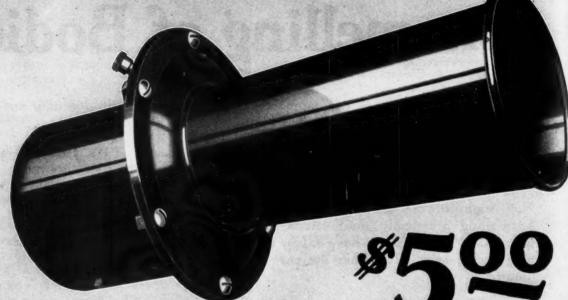


OXFORD VARNISH CORPORATION

Main Office: Empire Building, Detroit

Plant: Toledo, Ohio





(Western price, \$5.25)

(For 50c additional, a push button and wiring is included.)

\$500—Think of that. For a real, honest-to-goodness Stewart Motor Horn. Talk about value. It's got anything beat you've ever seen.

Don't confuse this Stewart Horn with other low priced horns because its selling price is only \$5.00. You'll know the difference when you hear its powerful tone. It's got the power and pep of a high-priced signal.

A real Stewart built motor. An extra large size bell. The entire horn is finished in a brilliant black enamel.

At its exceptionally low price this new Stewart Horn is sure to be a great sales booster. Get in your orders now to insure quick delivery.

STEWART-WARNER SPEEDOMETER CORPORATION, CHICAGO, U.S. A.

Sleward

CUSTOMBILT ACCESSORIES
USED ON 9 MILLION CARS

Accessories



\$400—Think of that. A handy little Stewart Searchlight that throws a strong piercing beam of light. Substantially built. Attractive enough to be a beautiful addition to highest priced cars.

You can swing this handy searchlight in any direction. You can easily detach it for use as a trouble light.

Light weight and compact. Dust and moisture proof. Finished in black enamel with nickel bezel. Polished silver reflector.

This new Stewart accessory will double your searchlight sales. Stock up now in time for the good driving season.

STEWART-WARNER SPEEDOMETER CORPORATION, CHICAGO, U.S.A.



CUSTOMBILT ACCESSORIES
USED ON 9 MILLION CARS

BADGER TIRES



The proof of quality lies in the splendid record of service obtained from BADGER TIRES.

Every where it is recognized as a permanent, competitive, serviceable line that is hard to equal.

For every type of service there is a BADGER Tire, and live Dealers all over the country have built up a large and profitable business with this line.

If you are not satisfied with the quality or profit of your present line, or if you are not handling tires at all, it will pay you to investigate BADGER.

Dealers supplied through the Jobbing Trade

THE BADGER RUBBER WORKS

MILWAUKEE, WISCONSIN

Sell both of these profitable fast selling accessories

Rid-Ged Grip
Evr-Klean

Wedford
Rid-Ged Grip
STEERING WHEEL TIRE

Wedford
Evr-Klean
SEAT PADS

Motorists want the "Rid-Ged Grip" Steering Wheel Tire because they know how hands and gloves slip on

Tire because they know how hands and a bare wheel—they've seen the varnish wear off and become unsightly—and they've experienced the discomfort of perspiring hands against a bare wheel in summer, and its coldness in winter.

"Rid-Ged Grip" supplies a soft, cushionlike positive grip for hands and gloves. Cool in summer. Warm in winter. It's a rubber tire with ribbed surface. Covers up varnish wear and stains. Protects wheel from mechanic's grease. Fits all steering wheels. Standard equipment on Pierce-Arrow cars. A big allyear seller with a worth-while dealer's profit. Sell it! and sell this, too!



Wedford Stimsonite Safety
Tail Light Lens
Reflects brilliant red against any
light approaching rear of car,
within 250 feet. Replaces ordinary tail light glass. A safety
signal when light fails. Bright
red when light is on. Fits all
standard lamps.

Here's the leader of the Wedford quick-turn-over line! Protection for clothing and car upholstery in open cars

and enclosed, summer and winter. The double service of the DeLuxe and Standard models makes them all-year sellers. Seat pads and seat covers combined. And now made larger in every dimension than the old style. Two fairly cover the seat cushions in any car.

Larger pads at lower prices: DeLuxe, \$2.00; standard, \$1.50; Handy, \$1.00—with a profit that appeals to every dealer! Made of durable imported straw. Hinged with khaki cloth. Both the DeLuxe and Standard models are clothlined on the reverse side. The DeLuxe is faced with Alligator finish Leatherette. Be able to supply the big spring demand. Order now!

Next time your jobber's salesman says, "Good morning", be sure to order these profitable Wedford accessories! "A Wedford Product Always Sells"

Wedford "Evr-klean" Seat Pads.
Wedford "Rid-Ged Grip" Steering Wheel Tire.
Wedford "Stimsonite" Safety Tail Light Lens.

Wedford "Anti-Rattlers" for car and house windows Wedford "Air-tites"—valve cores and caps.

THE WEDLER - SHUFORD COMPANY, ST. LOUIS, U. S. A.

AUTOMOTIVE PRODUCTS

Mar



The IDEAL LINE for Every Automotive Dealer

S the years go radio is a new industry. But, it is now old enough to have proven itself a staple industry—one that is filling a definite need and will continue to fill that need through the years to come.

Far-seeing automotive dealers have recognized this fact. They know that radio receivers are a natural addition to their present established business, greatly increasing their profits without any material increase in overhead expense.

The Crosley line of Radio Receivers has shown itself to be ideal for the Automotive Dealer. The wide variety of instruments contained in it, the great demand for these instruments created through actual performance and consistent national advertising and the quick, easy sales have helped many an Automotive Dealer to greater profits and a more staple business.

You, too, will find among the Crosley Radio Receivers shown here, an instrument to suit the desires, tastes and pocket-books of everyone of your present customers, and the many more that will come to you because you handle Crosley's.

CROSLEY MODEL 51—\$18.50

There is our newest receiver, the Crosley Model 51. A two tube Armstrong Regenerative set, illustrated above, licensed under the Armstrong U. S. Patent No. 1,113,149, it is indeed a triumph in radio engineering. Although it consists of detector and one stage of audio-frequency amplification it sells at the very low price of \$18.50.

CROSLEY TYPE V-\$16.00

A one tube regenerative set, li-censed under the Armstrong U. S. Patent No. 1.113,149. Actual per-formances of this little receiver have proven a revelation to the radio world. The MacMillan Expe-dition have considerate here described dition has consistently been clearly brought in with this instrument as well as Honolulu and other far distant points.

CROSLEY TYPE 3-B-\$42.00

CROSLEY TYPE 3-B—\$42.00

This three tube regenerative receiver licensed under Armstrong U. S. Patent No. 1,113,149, combines the Crosley Type V single tube receiver and the Crosley two stage amplifier. In the hands of amateurs and professionals alike it has consistently out-performed sets costing a great deal more. A person hearing a broadcasting station may turn off the set by throwing switch and come back later without re-tuning.

Write for Complete Information of the Crosley line of Radio Receivers and Parts. For Sale by Good Jobbers Everywhere.



CROSLEY TYPE V \$16.00

THE CROSLEY RADIO CORPORATION

Powel Crosley, Jr., President

Formerly

The Precision Equipment Company and Crosley Manufacturing Company

3534 Alfred Street,

Cincinnati, Ohio

TYPE 3-B \$42.00



Make Old Motors Run Like New



N re-conditioning used cars for resale----on jobs were noisy motors, poor compression,

or oil pumping is the complaint, Ramco Cushion Inner Rings should be installed.

They centralize the piston and stop the piston slap. They hold the piston ring in perfect conformity with the cylinder walls throughout the stroke at any motor speed or temperature. They keep the oil out of the combustion chamber and the gasoline out of the crankcase.

Double the profits on piston rings by installing Ramco Cushion Inner Rings on every overhaul job.



RAMCO INNER RINGS

RAMSEY ACCESSORIES MFG. CORP.

ST. LOUIS, MO.

Of these big Buses



Splendid **Territory Open** To Aggressive **Distributors**

We Intend to Blaze a Trail

For The Kelso

Man In Every Town

If you are a progressive dealer anxious to build up a profitable business as a

"Kelso **EverReady Brake Linings** Wear Longer-

-and are much more effective than any other Brake Linings we have ever used," says
Mr. Bollum, President of the
Twin City Bus Co.

They, like many of the larger Bus Lines and Taxi Companies to whom braking efficiency and long life are of utmost importance, use Kelso Ever Ready exclusively.

KELSO MFG. CO. Trenton, N. J.

brake lining specialist, we have an interesting proposition to offer. We will help you with—
High-grade Motor Driven Relining machine at small cost;
Cabinets for Display; Mats for newspaper advertising; Kelso MAN metal service signs; Posters for the windows, etc. BRAKE LINING & Clutch Facings



CARBON REMOVING BRUSH

Carbon Removing is now a Quick, Easy Job

WITH the Sioux Carbon Removing Brush you can do the job right—
peel off all carbon deposits easily, quickly, thoroughly.

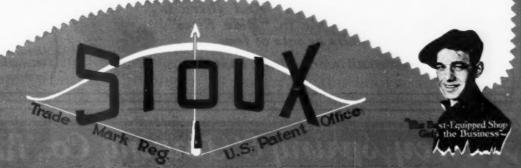


Notice the construction — specially made stiff wires overlapping each other and making a double contact. This permits use of brush either in verticle position or tilted, so that you can get into the corners and do a real clean job. Made in two sizes—No. B66 with heavy wire for rough surfaces where carbon must be taken off by force—and No. B67 with fine wire for machined surfaces and for aluminum pistons where high polish is required. Set of two sizes, (No. B68.)

Used with small electric drills or Sioux Flexible Shaft.

Ask Your Jobber About Them

ALBERTSON & CO. . . . Sioux City, Iowa.





Harvey Service Hits the Bull's eye and Harvey Advertising Reaches over 17,000,000 people every month.

Harvey Service brings the motorists who need spring service to the Harvey Dealer. Motorists have learned to look for the Harvey Service Sign. They know it stands for better springs, quicker delivery, less trouble. Every month more than 17,000,000 read the Harvey Message in The Saturday Evening Post, The Country Gentleman, Collier's and Motor Life. When they need springs they look for the Harvey Dealer. He gets the sales—and profits.

Motorists who want perfect riding comfort can be sold Harvey "Ride Rites", the shock-absorbing spring. They absorb both big and small bumps—rough roads turn to velvet. And there is double sales volume in "Ride Rites". They sell in pairs or sets of four.

Write for full information. Dept. F.

Correct Spring Design (Shock-absorbing qualities built in) attains its highest development in Harvey RIDE-RITE Springs

Harvey Spring & Forging Co., Racine Wis.

Reproduction of one of the AC 1075 Ads in The Saturday Evening Post



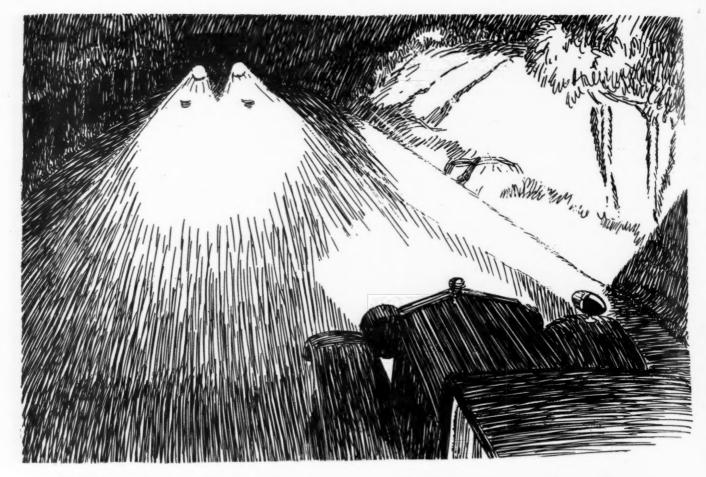
How the AC 1075 is being advertised in national publications to the Ford owner

Thousands of dealers are building a big, profitable spark plug business among Ford owners on the AC 1075—a better plug for Ford engines—and you make a larger profit on them.

Write us for the attractive fibre poster, in colors, of the above advertisement which we have for you—to connect your store with this impressive AC advertising.

AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs — AC Speedometers
U. S. Pat. No. 1,135,727, April 13, 1915; U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pendin;



Night Driving Made Safe!

Jacobs Road Lite shows YOU where to drive and counteracts the blinding headlight glare of approaching car without interfering with its driver's vision.

\$4<u>.00</u>



Jacobs Road Lite is furnished complete ready to be installed with wire, switch, necessary screws, nuts, washers and 21 candle power bulb. Road Lite is furnished in black or nickel.

JACOBS Road Lite, attached to right front fender throws a strong, bright light to the RIGHT of the road and 60 or 70 feet in FRONT.

Driver sees just how much room he has to the RIGHT. He can run close to edge without slackening speed.

Light from Road Lite cannot shine in eyes of approaching car drivers.

You take curves with safety. No slackening of speed at approach of glaring headlights. Nothing but safety on the darkest of nights or in the face of powerful searchlight headlamps. Sold only through legitimate jobbers. If your jobber is out of stock we will ship direct to you and bill HIM.

Jacobs Auto Safety Lamp Co., Inc., Blacksburg, Va.



Jacobs Road Lite is installed on RIGHT fender only. It is NOT connected to lighting switch but is independently wired so that driver can use it AT WILL from his seat.

Jacobs-Road Lite
Lights the way to safety

SPARK PLUGS

The new big red Bosch Spark Plug -a new plug for you to talk about to your customers-one that will get their interest at once. It is designed, built and tested according to the famous Bosch standard of accuracy and the famous Bosch quality of material. The Bosch red Spark Plug is as perfect a spark plug as can be made.

The insulator is of "Ambosite," a new nonclay chemical composition (not porcelain) of remarkable strength and insulating properties. Intense heat or the slip of a wrench won't break it-high electric voltage can't puncture it. Electrodes are nickel steel and crescent shape. Sell Bosch Spark Plugs. Back up your reputation with the reputation of Bosch quality. Identify yourself with the big Bosch national advertising campaigns. Be sure and sell

the genuine Bosch plug —the plug with the red body and the Bosch trade mark.

Five types service all popular cars—you can carry a small stock and get quick turnover Prices: Ford size 75c. Regular size \$1.00.

Wire for sample. Sent C. O. D. and liberal sales proposition.



BRANCHES:

Main Office and Works: SPRINGFIELD, MASS. NEW YORK

CHICAGO

SAN FRANCISCO



* the Secret of Sales
and



Motor car, truck and tractor owners are not being fooled like they used to be on oils and other lubricants. Many have experimented and paid dearly for it. Today the quality product is the product that sells.

For that reason <u>MonaMobile</u> Motor Oils and Greases have steadily gained new friends and users by the thousands. <u>MonaMobile</u> Lubricants have the quality — a standard of perfection maintained ever since the birth of the industry. Customers recognize this quality. Once they use <u>MonaMobile</u> Lubricants, no other brand will fill the bill. You, Mr. Dealer, want the trade and profits the <u>MonaMobile</u> line will bring!

Investigate! Be the MonaMobile dealer in your town or city. It's a sales franchise that means more sales—more profits. We back you to the limit on these well known, well liked, well advertised products. Investigate! Write today for full details of our liberal proposition.

MONARCH MFG. CO. Council Bluffs, Ia. Toledo, O. Pacific Coast Division:—
MonaMobile Oil Co.
Los Angeles

MonaMobile

"Ever Since the Birth of the Industry"





PRICE

\$9.50



ELECTRIC

Windshield Wiper

A new electric windshield wiper designed and built on a new principle and backed by the reputation and guarantee of the American Bosch Magneto Corporation.

The Bosch Electric Windshield Wiper has more selling and service features than any windshield wiper you ever saw.

Quiet—no train of gears to rattle, no pumping noises, no clicks or clatter. Powerful—plows off snow, slush and rain when other devices falter and stop. Its sweep is constant—not affected by engine or car speeds. It costs nothing to run—uses less than 1¼ amperes.

Order a sample now at quantity discounts. Sent C. O. D. with full sales proposition. Identify yourself with the great Bosch national advertising campaign.

AMERICAN BOSCH MAGNETO CORPORATION

Main Office and Works: Springfield, Mass.

BRANCHES:

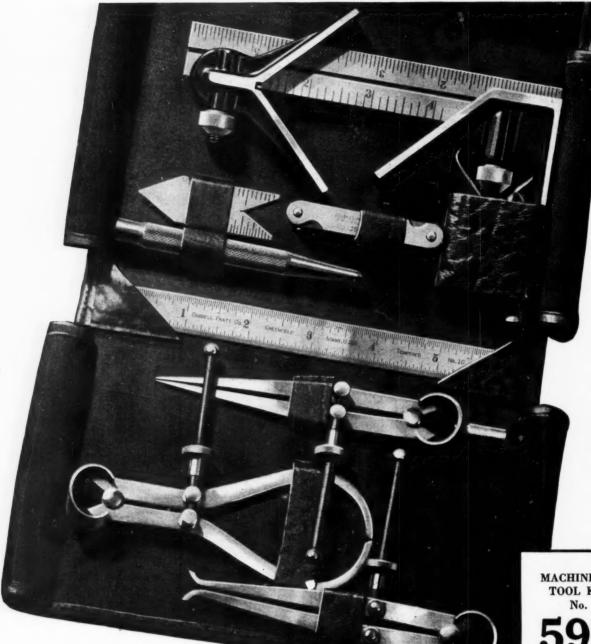
NEW YORK

CHICAGO

DETROIT

SAN FRANCISCO

AMERICAN BOSCH MAGNETO CORPORATION



MACHINISTS' TOOL KIT

Price, complete, \$9

The tool kit for machinists

For the mechanic who wants to be a machinist, here is a set of tools to give him the right start. This set includes the necessary tools for accurate work—every tool an essential tool. The case is heavy and flexible, lined with canvas and measures $7\frac{1}{2} \times 4\frac{1}{2} \times 1\frac{1}{2}$ inches.

In the Goodell-Pratt factories 1500 Good Tools are made. A postcard will bring you our booklet, "Tools for the Toolmaker"-free of charge. It illustrates the entire line of machinists' and precision tools.

GOODELL-PRATT COMPANY,
U. S. A. Greenfield, Mass.,

Toolsmiths,

1500 GOOD TOOLS

Wasson Motor Check

THE Wasson Motor Check is a complete testing unit that measures with scientific accuracy the performance of a motor in every essential factor; including the following most important items: horsepower delivered at the rear wheels, slippage past rings and pistons in cubic inches per minute, compression in each cylinder and dilution of oil in percentage.

If the motoris not right it tells why and where—with mechanical precision.



Horsepower at rear wheels

-one of three dials that gives a positive record of car efficiency at any speed, under any load.



As a Merchandising Factor

The Wasson Motor Check offers important benefits to the consumer and to the trade.

Repair men can diagnose any car by a careful interpretation of the Motor Check findings. That saves all needless expense of cut-and-try methods. After the engine has been brought back to standard—the Motor Check proves the job.

Distributors of motor accessories can prove the relative value of their products by comparative tests on actual cars—under any conditions of load or speed desired. No ruleof-thumb—but specific proof.

Fleet owners can maintain every unit of their fleet, at minimum expense, by a simple system of periodic tests on the Motor Check. No waiting until trouble develops.

In a word— it diagnoses motor troubles; a generic contribution to the automotive industry.



Wasson Motor Check stations are now in operation at Washington, D. C., Boston, Rockester, Newark, Orange, N. J., Baltimore, Grand Ropids.

A Tell-tale Check on Used Car Values

THE Wasson Motor Check offers the only solution to the problem of fixing the value of used cars.

How?

By providing an accurate mechanical measurement of car condition as is. It substitutes facts for guess work; conclusions for arguments; a certified valuation for a fictitious estimate.

Cars turned in for resale in 1923 cost American dealers \$2,000,000,000!

This year, a conservative estimate is that 80% of car business will involve exchange and resale.

There's dynamite concealed in the used car problem! All the inherent instinct of the proverbial "hoss trader" is roused to action when your prospect tries to sell you his car. He thinks he knows more about it than you do—but you can't resell it at his price and stay in business!

Can't you see at once how the Wasson Motor Check fits into this picture?

Where confidence and value are at stake there must be an infallible and impartial measuring rod, and the Motor Check fills this need—sets the danger line for you on the car coming in; then on the resale it proves, under the buyer's eyes, that the car is worth your price!

Your banker will tell you that Wasson Motor Check findings are the soundest basis for credit that has ever been devised—the only reliable authority in used car transactions.

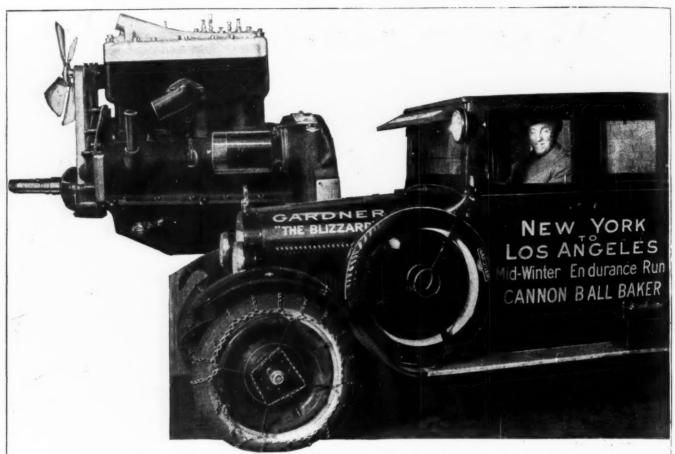
Today—prominent motor marts and used car exchanges are developing a program which includes a motor check rating on every car they handle.

Stop gambling with your profits. Here's the solution to the used car dilemma. Write for facts and figures about this vital contribution to better business.

T-N-T Engineering Co., Inc., Newark, N. J.

Manufacturers of T-N-T Piston Rings and the

Wasson Motor Check



An Amazing Achievement!

LYCOMING-Powered GARDNER Sedan makes Record Mid-Winter Cross-Continent Run

ESET by adverse road and weather conditions over nearly all the 3398 miles and compelled to use chains for 1396 miles; "Cannon Ball" Baker drove a stock Gardner sedan from New York to Los Angeles in February for a mid-winter and a sedan record.

So satisfactory was the performance that every day's run elicited the driver's praise of the Lycoming motor—a 4-cylinder $3^{11}/_{16} \times 5$ used by Gardner.

Neither snow-drifts nor Missouri bogs could halt the car. Conquering roads that were declared impassable, mud holes and gumbo, "Cannon Ball" Baker wired back, "Never made a second attempt at bad spot, car plowing through on first attempt."

He Gardnered across the Rockies "with snow covering peaks on all sides and blizzards raging," conquering the snow-drifts of Blue Canyon Passat night, in high practically all the way, and then after nearly 900 miles of mountain grades, snow-drifts, washouts and desert sand trails, he summed up in these statements:—

"Motor displayed true pulling power when it walked easily over pass with 4,000 pound load.

"Car finished gruelling week's journey strong; motor purred beautifully over last three hundred miles. "Performance of car perfect, never failing in pinches and always delivering when called upon for speed."

The remarkable performance of the Gardner car proves it to be a soundly good job and corroborates some of the fine things that have been said about the Lycoming 5-Bearing Crankshaft Motor with which the car is powered.

LYCOMING MOTORS CORPORATION

Makers of Fours and Eights-in-Line

WILLIAMSPORT, PENNSYLVANIA

LYCOMING Motors

The job's the thing



ON November 13th last, in the pioneer Motor Check station in Newark, the service engineer of a forty man-power shop ran a "trouble" car up on the Wasson Motor Check. The skeptics and second guessers were there to observe.

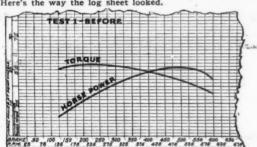
They saw that car—an average car—build up only 21 horsepower at best speed. About 20% off standard.

Everything was wrong, except the carburetor, the fuel and the oil. These three items, in fact, had been made right while the car was on the Motor Check. "Twenty-one horsepower as is! . . . pretty rotten, and after two tear-down jobs at that!" The service engineer said that, only with more emphasis.

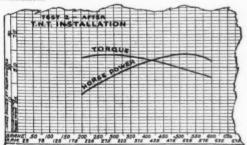
Just an average car in the average condition of four out of five cars on the street. Compression weak; back pressure fighting the pistons; slippage of working charge about 300 cu. in. per minute more than it should be.

The Motor Check showed it all up in dial readings.

The Motor Check showed it all up in dial readings. Here's the way the log sheet looked.



ON November 15th—same car, same audience, same test; but here's the log sheet for the second demonstration.



TWENTY-FIVE horsepower; compression right; slippage reduced to normal! A net increase of 20% in horsepower! Between the check-in test and the checkout test the car had been restored to standard performance with a T-N-T installation; and the Wasson Motor Check proved the job.

Today T-N-T Piston Rings and the T-N-T Restoration Methods are standard in that service station. Just one demonstration among hundreds that have been made during the past three months.

Do you see it coming?—every Wasson Motor Check a proving station for T-N-T installations.

ALREADY there are a score of service stations using it to create and control repair jobs. That means piston ring business.

One great fleet operator is testing cars on the Motor Check for maintenance, and subjecting all motor parts and supplies to comparative demonstration tests. That means piston ring business.

Automobile dealers have organized Motor Marts around the Motor Check, to certify car condition and to find out what the trade-in car needs to make it right and saleable. That means piston ring business.

One of the largest oil companies in the country has adopted it to prove the importance of the oil seal to motor power, and the relative efficiency of different oils, and is building a powerful advertising campaign back of the idea. That means publicity.

not the piston ring!

WHAT was it old Archimedes said?—"If I could find a place to rest my lever I'd move the world" -or something like that.

We've found a solid foundation for the T-N-T Piston Ring lever, and we know something's going to move,and move fast.

We rest our case on the job itself—car performance, checked and proved on the Wasson Motor Check!

We are not marketing piston rings: we are selling motor performance, the key to every branch of the automotive industry whether it is manufacturing, selling, servicing, or reconditioning.

We are selling the only thing you can sell and keep sold: a job well done and proved up.

We are selling a scientific installation job:—the torsioned T-N-T Piston Ring and the T-N-T Restoration Method.

We are selling a job that can be checked in and checked out on the Wasson Motor Check, the only machine that tests over-all car performance, measures the car "as is," puts an X-ray on the works, and can't be faked or fooled. No job can "get by."

The repair man who installs T-N-T Rings will create the highest class shop in town, because his jobs will prove up and stay proved. And the widespread publicity that the Wasson Motor Check arouses will inevitably steer business to the specialist in T-N-T products.

The distributor or dealer in T-N-T rings finds himself in a fortunate position. He has the only torsion tested piston ring that is being made, and he will have a natural monopoly in the tremendous merchandising value of Wasson Motor Checks, wherever they are located. That means every city and town within a short time.

Write us for details, terms and territory.

T-N-T Engineering Company Newark, N. J.

Manufacturers of T-N-T Piston Rings and the Wasson Motor Check



Marc

E

The SPOTLIGHT

WILL FIND WHAT YOU WANT



For inexpensive, quick-acting, result-producing publicity use Spotlight Service-it is a good doctor for any business want.

Whether you want to buy or sell Spotlight Service can help you. These little ads work both ways.

Some other reader wants to buy what you want to sell -let Spotlight Service find him for you.

To find men or employment, to locate business opportunities, to sell, rent, exchange or buy, Spotlight Service will help you.

a word

a word

Spotlight ads can be bought today at prices everyone can afford to pay.

EVERY DAY—EVERY HOUR—
SOME ONE—SOMEWHERE—has a
business want that could be satisfied
quickly by someone else in the industry. Tell your troubles to the
Spotlight Department and watch for
the quick results.

a word

Have you anything to sell-used machinery, spare parts, surplus stock of any kind. Let Spotlight Service find you a buyer.

You can find it, You can sell it Use a Spotlight ad to tell it

a word

The live men of the industry read their business paperyou can reach them through Spotlight Service.

If you need good men in your business, if you are looking for a better position, if you want to buy or sell used machinery, Spotlight a word Service will help you.

Nature dislikes junk piles. If you have any "junk" in your plant let Spotlight Service turn it into cash.

Whether you want to buy or sell Spotlight ads will do it well

a word

Spotlight advertising is Opportunity advertising 6¢ a word

The Spotlight Department this week is on page 145



SM cure STRATE VOLCE

"A Shaler, A Match; Five Minutes, A Patch!" 40,000,000 Shaler Patches Used Last Year!

Every Sale Brings a "Repeat"



Ask Every Motorist—
"Got Plenty of Patches for Your
5-Minute Vulcanizer?"

Dealers who ask this easy question tell us it sells 50% of their customers who come in to buy other things. It works, try it.

Coming Soon! Advertisements in The Saturday Evening Post and other large national publications.

Bigger than ever.

Continuous year-in-and-year-out advertising to motorists, plus the usefulness of the Shaler, has created a steady, profitable market for this popular accessory. One motorist tells another. Every vulcanizer you sell starts a chain of sales on Shaler Patch-&-Heat Units for use with the vulcanizer. Your turnover is quick. That means you never have a large amount of capital tied up in stock—yet you make an excellent profit on steady repeat sales all year 'round.

Ask Your Jobber's Salesman

or write for discounts, display material and effective sales helps which connect your display window to our national advertising.

C. A. SHALER CO., 206 Fourth St., Waupun, Wis.

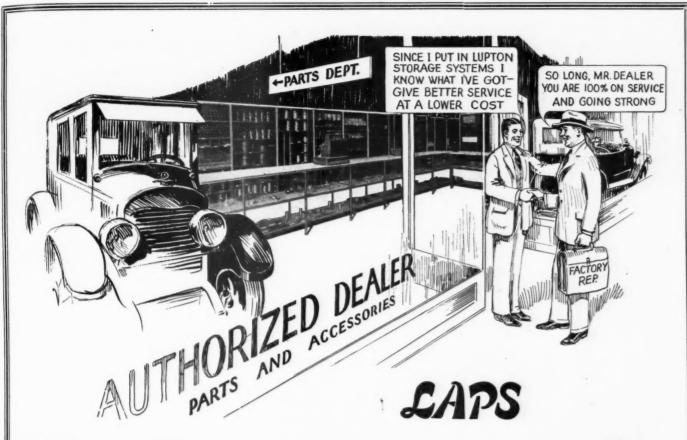
GATES HOSE

"The Standardized Radiator Hose"



Gates Vulco Hose is now outselling all other kinds of radiator hose—proof, isn't it, that it's quality that builds a business.

> Made by the World's Largest Manufacturers of Fan Belts.



The direct route to profits is through orderly system

There Is a LAPS System for each of the Following Cars:

Buick Hupmobile Chandler Jordan Chevrolet Maxwell Cleveland Nash Oakland Dodae Durant Olds Essex Overland Ford Star Studebaker Hudson

Buy Your Parts Systems assembled ready for use. Unassembled systems always cost more in the end.

LAPS will systematize your parts business
System is organized knowledge
Knowledge is power
Power is success
Success brings

\$ \$ \$

DAVID LUPTON'S SONS CO.

Main Office & Works: PHILADELPHIA
Sales Office, 919 Majestic Bldg., DETROIT

LUPTON AUTO-PARTS STORAGE

Marc

A large percentage of Cars require Clutch attention Right Now!

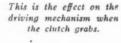




The grabbing clutch reduces tire mileage.



It is dangerous to operate a car with a grabbing





A slipping clutch is a poor hill climber, and a hazardous brake descending hills.



S. E. A. SUGGESTION No. 2

driveyour customers' Gas the Business cars around the block and check the clutch action. You will be surprised at the number you find that are slipping or grabbing. Call your customer's attention to the unnecessary tire wear, the terrific jars and strains on the mechanism, and the dangers of driving a car with a grabbing clutch.

A slipping clutch means unnecessary gas consumption, poor climbing ability, unsatisfactory driving in general and great danger when the low gear is used to brake on hills. Sell clutch overhauling jobs and render a distinct service to your customers.

There Is No Argument-

THE BEST EQUIPPED SHOP GETS THE BUSINESS

We would like to help you solve your problems, because your problems are what we are in business to solve.



Write to SERVICE EQUIPMENT ASSOCIATES

Towson, Md.

or

Service Equipment Associates as listed below:

Albertson & Co., Inc	Sioux City, Iow
T. R. Almond Mfg. Co	Ashburnham, Mass
The Black & Decker Mfg. Co	Baltimore, Md
Bastian-Blessing Co	Chicago, Ill
Bonney Forge and Tool Works	Allentown, Pa
Brunner Mfg. Co	Utica, N. Y
Burton-Rogers Co.	Boston, Mass
Continental Sales Corp	Columbus. Ind
Kellogg Manufacturing Co	Rochester N V

The Manley Mfg. Co	York, Pa
Frank Mossberg Co	Attleboro, Mass.
Oxweld Acetylene Co	Newark, N. J.
Stevens & Co	New York, N. Y.
Van Norman Machine Tool Co	Springfield, Mass.
Weaver Mfg. Co	Springfield, Ill.
Weidenhoff Products	Chicago, Ill.
Wood-Imes Mfg. Co	. Minneapolis. Minn.
Wright Mfg Co	Liebon Ohio

All GILLIAM Tapered Roller Bearings are made so that the radial load is distributed over the entire length of the rollers. This insures maximum carrying capacity.

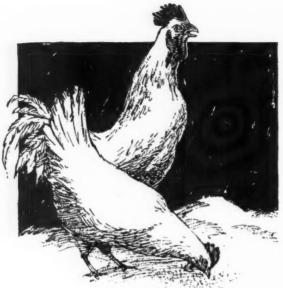
> Axle manufacturers using Gilliam Tapered Roller Bearings include: Adams, Clark, Columbia, Flint, Salisbury, Sheldon, Standard Equipment, Torbensen, U S, Vulcan, Wisconsin.



THE GILLIAM MFG. CO. - Canton, Ohio



March



If a motor had a giggered

—the dirt, grit, sand, etc., drawn in from the road and air, would have a place to go instead of into the cylinders and the lubricating oil. But, since it hasn't, it becomes necessary to prevent the engine from picking up these destroying abrasives—A simple process with—

Dealers who are now making deliveries of new cars and equipping them at once with United Air Cleaners appreciate the fact that the customer, who day after day and month after month, finds his car improving instead of requiring service, will be a booster.

On the other hand, the owner who gets the road dirt, grit, sand, etc., into his engine at every revolution cannot help but have continual trouble with his car.

So, aside from the profit you make selling a United Air Cleaner you put a protector on your customer's car—new or old—that practically eliminates the influences causing the majority of motor troubles.

It's a simple road to success.

Chrysler, Elgin, Franklin and 84 other manufacturers use it. It is easily installed. Weighs but 18 ounces. Is very neat. Requires absolutely no attention.

The United Mfg. & Distributing Co.

9703 Cottage Grove Ave., Chicago, Ill.

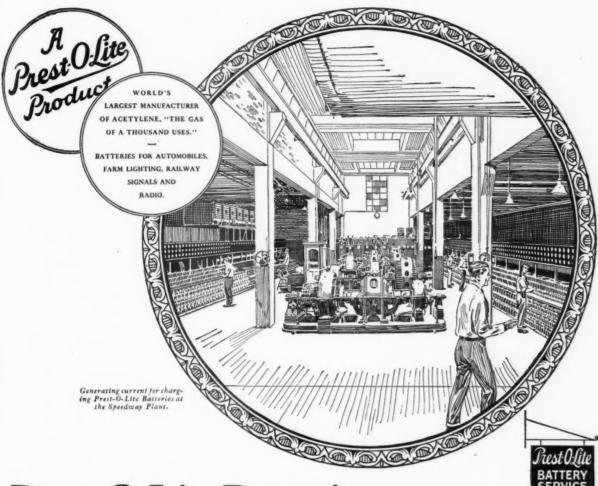
Me UNITED AIR CLEANER

Dustless Air to the Motor





24



Prest-O-Lite Batteries Always Work

Assurance of dependable battery performance lies in the name Prest-O-Lite.

For twenty years, this name has identified an ever-growing field of products characterized by highest quality and unfailing reliability.

When you sell a car equipped with Prest-O-Lite, you know it has a dependable battery—and you know its owner has national access to the wide-spread Prest-O-Lite service, known to motorists as the "Friendly Service."

THE PREST-O-LITE COMPANY, Inc. INDIANAPOLIS, IND.

New York: 30 East 42nd Street Pacific Coast: 599 Eighth Street, San Francisco
In Canada: Prest-O-Lite Company of Canada, Ltd., Toronto

The Sign of "Friendly Service"

Service Stations Everywhere

For complete information about Prest-O-Lite automobile batteries, write to Indianapolis, Ind., Dept. I



Prest-O-Lite

THE OLDEST SERVICE TO MOTORISTS

And now Usaco Pioneers

Plate Valves

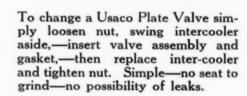
Years ago Usaco perfected the first self-contained fully automatic two stage compressor.

Today, two stage compressors are made and recommended by practically all air compressor manufacturers.

And Now, Usaco raises another new standard in using plate valves, for the first time, in a tire inflating compressor.

Although used for years in immense mill type compressors, their higher cost was considered prohibitive for small machines.

But enormous production, specialized effort, and a policy to use the best obtainable, even at higher cost, has made it possible to incorporate them in Usaco Compressors.





Rigid Piston Assembly—Long surfaces, Perfectly and permanently aligned. No possibility of piston slap. Piston impact largely distributed through yoke.

Regulated Pin Splash Oiling System—Cylinders supplied with minimum amount of oil necessary for proper, efficient, lubrication. Main bearings, connecting rod bearing and wrist-pin bearing flooded with oil thrown by splash pins and diverted directly to proper points by baffle plate arrangement inside the crankcase. Main bearings provided with catch basins and return vents, giving continuous oil flow across bearings.

Write NOW for complete facts about the compressor with these exceptionally efficient valves. And mark our prediction that this type of valve will come into general use.

The United States Air Compressor Co.
5304 Harvard Ave. Cleveland, Ohio

Pioneers - the World's Largest Manufacturers of Two Stage Tire Inflating Air Compressors

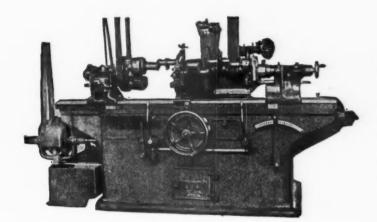
Even a Two-Mechanic Shop Can Make Money

with This Grinder

If your business is big enough to use two mechanics, it is big enough to warrant your having a good garage grinding machine. Note that we say "a garage grinder" and not the usual manufacturing grinder.

If you have two or more mechanics, you can make money from the very start with the Landis 4-A Special. This machine is for automotive repair work exclusively. Can handle everything but cylinders. So simple in operation that the average garage mechanic can regrind crankshafts upon short acquaintance.

Easy and rapid change from job to job is also a feature. You can finish a set of pistons and change over to a crankshaft in a surprisingly short time. Then can come piston pins, shackle bolts, ends of drive shafts—whatever the job, the Landis 4-A is exactly the machine for it.



We are the largest builders of grinding machines. Due to this, we enjoy large volume and are in a position to offer distinct PRICE advantages.

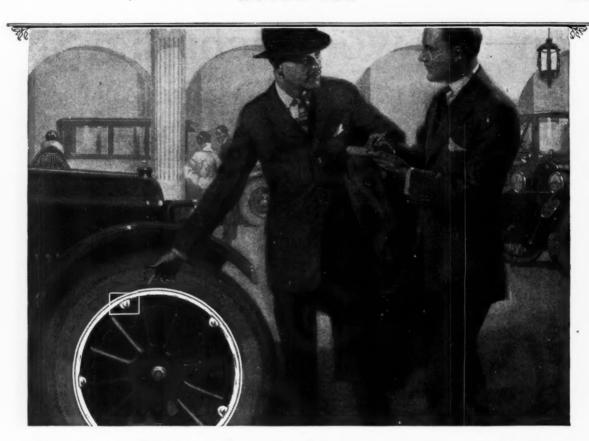
Catalog and quotations gladly furnished.

LANDIS

LANDIS TOOL COMPANY, Waynesboro, Penna.

New York Office—30 Church St.

Marc



Hayes Wheels Influence Car Sales —Look for the Attached-Lug

More and more, the attention of the wise motorist centers on the wheels of the car he buys. He looks before he buys, because then is the time when he can add to the convenience and shorten the time required in making tire changes. Motorists have one certain sign to guide them in making wheel-decisions—it is the Attached-Lug. It denotes the most approved wheel—Hayes.

The attached-lug means that tire changes may be made in one-half the usual time. There are no loose lugs to lose—no lost motion, temper or time.

Every lug bolt holds the rim and shares

proportionately in the driving thrust instead of the usual practice of concentrated strain at a single point. Hayes rims cannot "run-out-of-true." They cannot squeak or slip and tear the valve stem; cannot cause uneven wear on tires and rims. This represents a decided saving.

Dealers who sell cars equipped with Hayes Wheels should stress their advantages to the motorist. It is just another aid in making car sales easier. Hayes wheels being standardized and instantly interchangeable give dealers a splendid opportunity to make "extra profits" in wheel replacement.

HAYES WHEEL COMPANY, Manufacturers, Jackson, Michigan Factories: Jackson, Albion, Flint, St. Johns, Mich.; Anderson, Ind.; Nashville. Tenn. Canadian Plants: Chatham and Merriton, Ont. Export Office: 30 Water Street. New York City

HAYES WHEELS

WITH ATTACHED LUG RIMS ~ STANDARDIZED IN WOOD, WIRE AND DISC



120

Lower Prices Lower Prices Bigger Volume Bigger Profit

Now \$

75¢



The original compression ring for replacement. Its greater flexibility and equal tension mean better performance in worn cylinders.

50°

The original oil reservoir ring for oil pumpers. Collects excess oil on each down stroke and empties on each up stroke, which ordinary grooved rings cannot do. Use one on each piston.

Remember

The best profits are in the best parts. Poor replacement parts can ruin a good mechanical job.

The same high quality at new low prices. These new consumer prices are subject to the usual trade discounts.

Have your jobber's salesman show you the complete McQuay-Norris line of piston rings, pistons, pins and bearings. Ask him for the new 1924 prices.



McQUAY-NORRIS

PISTON RINGS-PISTONS-PINS-BEARINGS

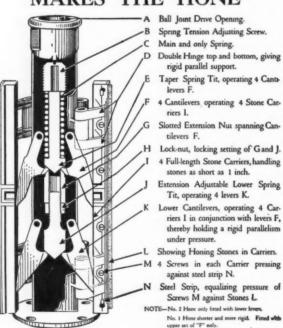
MCQUAY-NORRIS MFG. Co., General Offices, ST. LOUIS, U. S. A. Factories: St. Louis, Indianapolis, Connersville, Ind.; Toronto, Canada

Mar

"It Goes Right To the Job"

No Complete
Take-down
No lost time
No laid-up Cars
Cylinders resized
in 20 minutes each

PRINCIPLE MAKES THE HONE



Parallel Expansion of Stones

The expansion in the Hall Hone is controlled by one spring in the center of the hone body. Each stone receives an equal pressure to an equal distance. Each stone is rigidly hinged at top and bottom to prevent tipping or following a tapered cylinder. By soaking stones in kerosene all cuttings remain on the stones in the form of paste and do not drop into the motor bearings.

You want to make money and you may have the flat rate system to deal with. If your shop is not now equipped with facilities for resizing cylinders you can do so at a cost of only \$50. Three Dodge jobs will pay for a Hall Cylinder Hone.

Honing by the Hall Method saves you time and means a better job. The work is done on the chassis and the car occupies your floor space for a shorter period.

This appeals to the owner because his car is not tied up and he gets a first class job at a price that is not burdened with time charges for taking down and assembling.

The Hall Cylinder Hone and the Hall method of honing have been endorsed and recommended by leading automotive engineers. Buick for example has recommended it for use in all its service stations.

Recommendations such as these are made because honing is better for the motor.

The seasoned metal—the wear resisting surface that develops on the cylinder walls is not removed but is retained sufficiently to insure perfect performance and long life in this vital part of the motor.

The Hall Cylinder Hone Co.

435 Dorr Street, Toledo, Ohio

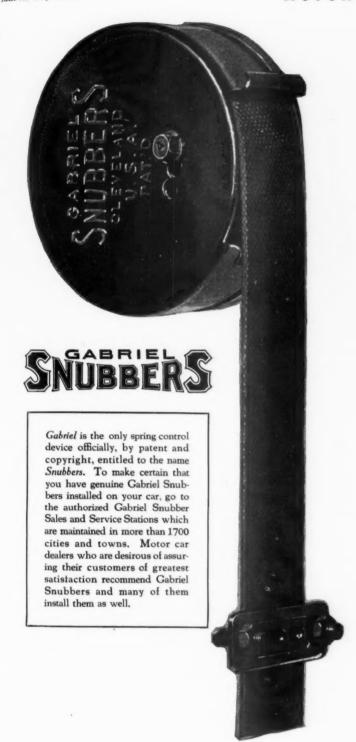
In Canada-Hall Gear & Machine Co., Toronto, Ont.

Send for this free book
TO-DAY

It gives all details. It will show the way to greater shop profits.



the seasoned metal is but skin deep-don't waste it



Features That All Car Owners **Appreciate**

Gabriel Snubbers bring car owners added comfort, and very definite savings in upkeep expense because they save the car from damage by road shocks.

These two Gabriel features are especially desirable during the Spring months, when roads are unusually rough.

You can sell many more sets of Gabriel Snubbers than you may think-just by bringing them to car owners' attention.

Owners of old cars as well as buyers of new cars are Gabriel prospects.

It is profitable business for you. The new Gabriel Sales Proposition pays you handsomely for your time and effort.

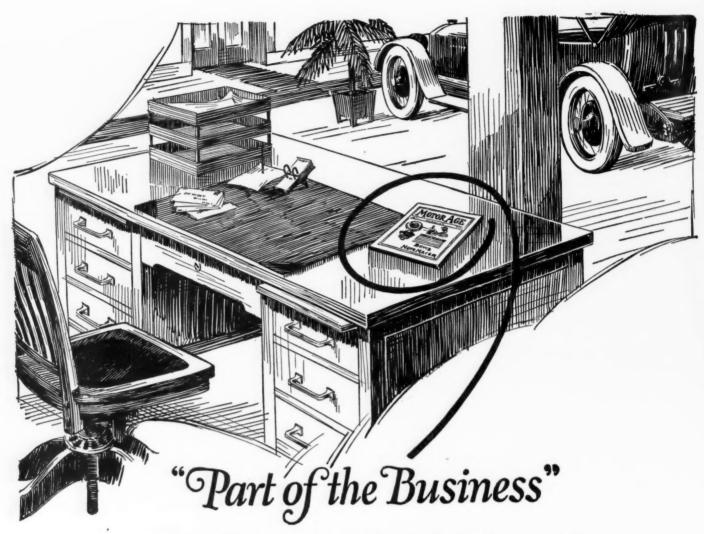
Stock Gabriels now-you can turn them over fast.

Write the nearest Gabriel Distributor, or to us direct, for full details.

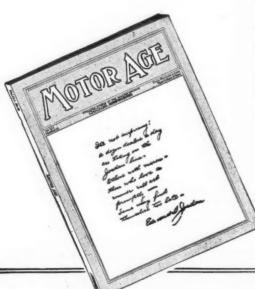
GABRIEL MANUFACTURING COMPANY
1415 East 40th Street - Cleveland, Ohlo Gabriel Manufacturing Co. of Canada, Toronto, Ont. ⊗ Sales & Service Everywhere ⊗

Greater

Streater Riding Comfort Snubbers



If an automotive merchant could travel through the country asking hundreds of other automotive merchants about their methods of doing business—if he could find out why some businesses have failed and others prospered—if he could hear the personal stories of success from the acknowledged leaders of the automotive trade—if he could do this he would return home a far broader man and a more progressive dealer than when he started. His mind would be filled with new ideas. His enthusiasm would be kindled. And his business would reflect the valuable lessons learned.

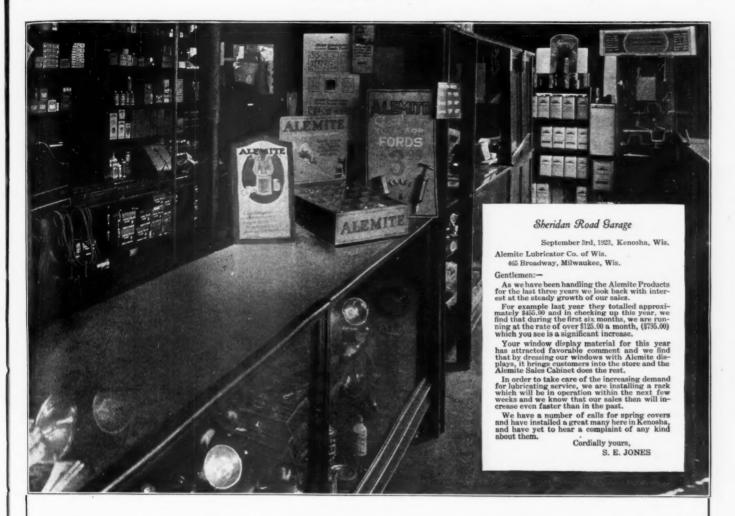


MOTOR AGE is making such a trip possible to thousands of automotive merchants the world over. Yet these men need never leave their desks, for in its columns MOTOR AGE presents information of inestimable value gathered from every conceivable source.

MOTOR AGE

5 S. Wabash Ave.

Chicago, Ill.



"Our Alemite Sales Are Over \$125 A Month"

-Sheridan Road Garage

How 2 sq. ft. on your counter can earn \$200 to \$1,000 profits yearly

The Alemite Sales Cabinet occupies only 2 sq. ft. on your counter. Read what Mr. S. E. Jones of the Sheridan Road Garage says about his sales of the Alemite High Pressure Lubricating System with this cabinet.

"—in checking up this year, we find that during the first six months we are running at the rate of over \$125.00 a month, (\$795.00) which you see is a significant increase."

He turned over his stock 6 times in 6 months

If you have 2 sq. ft. on your counter you can make it earn more with an Alemite Cabinet than any other space of equal size in your store. Thousands are doing it. Send for details.

With this Cabinet and the handy manual that goes with it you can quickly equip any car with the Alemite System. Also replace fittings lost or broken on any car. No experience necessary. Write today for our dealer cabinet proposition. No obligation.

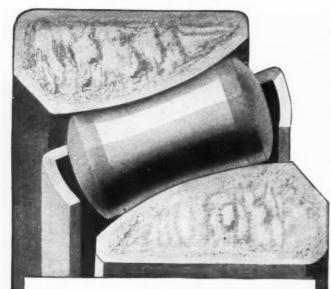
THE BASSICK MANUFACTURING COMPANY
2662 North Crawford Avenue, Chicago

A Bassick-Alemite Product

ALEMITE

High Pressure Lubricating System

-	THE BASSICK MANUFACTURING CO. 2662 North Crawford Ave., Chicage, III. Without any obligation on my part, please send me complete information regarding the Alemite line and the Alemite sales cabinet.
	I sell (Name of cars)cars I operate (check which)
	Name
	Street
	City

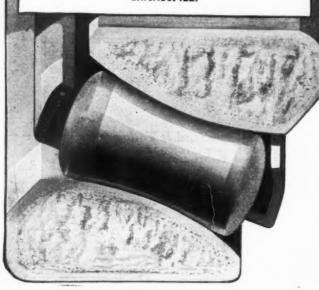


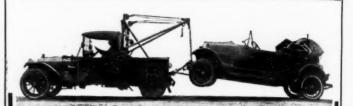
SHAFER Self-Aligning ROLLER BEARING

There is a Shafer Bearing interchangeable with practically any size of cup and cone front wheel ball bearing, including front wheel ball bearings now used in the Buick, Oldsmobile, Oakland, and Chevrolet. They are guaranteed to fit and render satisfactory service.

Our new service catalogue is now ready for Distribution.

SHAFER BEARING CORPORATION
6501 WEST GRAND AVENUE
CHICAGO, ILL.





A job in the shop is worth two by the road-side—but you can have all three.

Dealers, Service Stations and Garages continue to tell us that they are bringing in more new jobs and making greater towing profits than they ever found possible without their

HOLMES Auto Wrecker

One Service Station reported towing charges exclusive of an additional hour charge for men on the car, of more than \$11,000 in four years—an average of \$235 per month against which the only chargeable items were for maintenance.

3 Jobs in $4\frac{1}{2}$ Hours

The Daylight Garage of Evanston, Illinois, says: "The best investment we ever made. On July 4th I brought in 3 wrecks getting all the repair jobs and \$40 in tow fees. The 3 towing jobs took $4\frac{1}{2}$ hours and were handled by one man alone."

Holmes Auto Wreckers are the most highly developed wreck equipment available. They can be quickly installed on any car. One man can operate them on almost any job. The towed car tracks perfectly. Three models. Capacity 2 to 4 tons. Model 110 specially developed for installation on light cars.

Ask Your Jobber or Write Us Direct for Literature

ERNEST HOLMES CO.

Chattanooga, Tennessee

KINGSTON products have been known to motorists for a Generation

KINGSTON Ignition devices have been known to motorists for more than a quarter of a century. The experienced dealer knows that there will be, day in and day out, a steady and remunerative demand for products of the Kingston line.

It is this factor that has made the Kingston line so popular with dealers everywhere. They know that every motorist knows Kingston products, that motorists have been buying them for years, and will continue to buy them. Correctness of design, the test of materials and the utmost care in workmanship have contributed to that unswerving confidence that motorists everywhere have in the name Kingston.

Most dealers are cashing in on this steady demand, and have been for many years. For the dealer who is not acquainted with Kingston products, or who does not feel that he is getting his full share of this business, we have an interesting story to tell. Drop us a line.

KOKOMO ELECTRIC COMPANY

KOKOMO, INDIANA

KINGSTON

KINGSTON GENERATOR CUT OUT

Wise dealers know there is no better Cutout at any price than the Kingston. It is expertly made, and is built to last. Furnished with curred base to fit the Ford generator or with flat base for use on any six-volt system.



KINGSTON COIL UNIT



of Kingston Coil Units are in use. They have given excellent service on Ford cars for many years, and are recognized as wholly dependable.

LIST \$175

KINGSTON POINTS

Kingston Contact Points are extra large in size, and are suitable for use

both on Ford cars and Fordson tractors. Buy the genuine!



20c per

SER VICE

The "SURE-MIKE" is the only complete, counterbalanced



Get "ALLOVA" suits for your workmen! Advertise your garage, tire shop or service station and at the same time have your men looking neat and trim. "ALLOVA" work suits will do this for you and cost your employees no more than overalls.

Buy "ALLOVA" extra quality, long-wearing work suits Direct from Factory at these prices:

6 Suits-\$3.25 each 12 Suits-\$3.00 each

25 Suits-\$2.871/2 each 50 Suits-\$2.75

Your name or trademark attractively embroidered in red, blue, white or black, 25c per garment. These prices permit selling them to your employees at wholesale. "ALLOVA" work suits are exceptionally well made of best grade cloth, khaki or white. All in one piece. All buttons covered. Outwear ordinary work suits! Built comfortable and roomy. Hip and front swing pockets reinforced with extra thickness of cloth. Sizes 36 to 50.

Get a Sample Suit! Send us your name or trademark. We will make a special sample suit for your approval. State size and color wanted. If not fully satisfactory return suit at our expense. Write today.

MOTOR SUIT MFG. CO.

701 CENTRAL ST.

KANSAS CITY, MO.

Let Your Name Be Known "ALLOVA"

. It is Estimated That 500,000

Ford Cars Will Need New Crank Shafts This Year

At least one Ford out of every twenty needs a new crank shaft every year. That's a mighty big market and one that must be taken care of. Not even a Ford will run without a crankshaft. Get this big replacement business on the most satisfactory basis both to your customer and yourself. Recommend the

REG. U. S. PAT. OFF Counterbalanced CRANK SHAFT

Chicago

Ford Cars and Trucks

Crankshaft for Ford Cars on the market. It is one-piece drop forging. The counterbalances are neither welded to nor bolted on, and therefore cannot break off or come loose. It is precisely and accurately ground-finished and perfectly balanced to 2400 revolutions per minute. Replaces regular Ford crankshaft without any change in

motor or bearings.

Noise and vibration are practically eliminated. Smooths out cylinder explosions. Reduces wear on all parts of the car. Develops maximum power. Lengthens life of the car. Makes more comfortable riding and driving. Guaranteed for the life of the car.

Tell Ford owners about the "SURE-MIKE" Crank Shaft. They'll want it when they know that it is cheapest in the long run. We'll help you make sales with show cards and literature. Order two or three. Install one in your next job. The owner will thank you and advertise you. Liberal discounts.

Manufactured and Sold by

J. WADSWORTH STAFF: Executive Offices

643 McCormick Bldg., 332 So. Michigan Avenue,

Atlanta Office: E. H. Baughman, 816 Bona Allen Bldg., Atlanta, Ga. Also Manufacturers of

SURE-MIKE EXPANSION REAMER—The Practical Tool for Every Shop

Sold Only Through Legitimate Jobbers

924

7ENITH

The Zenith Float Mechanism and the Tests







(Upper) Zenith floats being weighed. A variance of one gram—1-28 of an ounce—from the specified weight causes them to be scrapped.

(Lower) Zenith needle points being inspected under a microscope which magnifies 144 diameters. This inspection discloses any imperfections however minute, which may remain after grinding.



There is a Zenith, tested and proven, for every motor.

With such modern instruments and such rigid inspection to guard the gas flow, a Zenith must be frugal—it is no wonder it is known as the economy carburetor.

And yet the speediest and most powerful engines are Zenith-equipped.

ZENITH-DETROIT CORPORATION

Manufacturer of

ZENITH CARBURETORS

DETROIT

MICHIGAN

NEW YORK

Branches:
CLEVELAND

CHICAGO

Service Stations in over 800 cities

March

New Car Order Blank

FORM 77

Destri Nama Marone Chevrolet	mai	-
	roupe	on
Address 1857 Locus Dt.	-	
Due 3/10/23		40
You may enter my order for one _19 x 3 2	rode	-
Werrolex You	ring	
	a soon as p	comble
10×1-400	525	-
Model 1973-490 F.O.B: Factory price	270	0
Tax, freight and delivery charges	582	2
Accompine 1- Brownser	13.0	0.9
Accession 1-laurager	10	0
- Park angur	-	75
		-
		-
Total cost including accessories	595	-
London de la contraction de la	273	2
Less allowance on la halenssa Car No. (26 42	100	-
Bourance and interest charges	1100	00
Total time payment cost	533	-
Down payment	1110	_
4	14V3	00
To be paid in 17 notes of \$ 35"=		_each
D. I.		
Remarks:		
To be paid in 17 Balance due notes of § 3.5-2	423	-
Pb		
Remarks:		
It is award that this car is much and by my Alice to the Manfacture's	Wananta	-Airk
It is agreed that this car is purchased by me subject to the Manufacturer' printed on the back of and made a part of this order and that it is the appressed or implied, made under this order.	only warns	ry. ed
The price queted is for immediate delivery, but if the price should be me	creased below	e I ha
		l, or sh
be annelled, at my option, and my deposit refunded. I contry that the car I am teading in it has from all uncumbration whater	never.	
Signed Log, P. Drell		
// 12 : 7/		
Address 1941 Warrew As		

Gives you a definite record of every new car sale, preventing misunderstandings with customer or salesman concerning price payments, allowance on old car, accessories, etc. On the back of each blank is printed a standard warranty, as approved by the National Chamber of Commerce.

Blanks are in triplicate—white for dealer, pink for purchaser, yellow for salesman. Twenty-five sets to a book, with 2 sheets of carbon. Size 5x8. Stiff marble board covers.

Prices—F. o. b. Your City
1 Book, 75c; 6 Books, \$3.50; 12 Books, \$6.00

For used car sales we have similar order blanks at these same prices.

Comfort Printing Specialty Company

101 N. EIGHTH ST.

ST. LOUIS, MO.



STANDARD QUALITY

Packed in convenient cartons and clearly labeled for easy handling.

Dealers and jobbers everywhere are changing over to Johnson Bushings for two very important reasons:

First, because they are better bushings, requiring little or no reaming for fitting.

Second, because they are packed in substantial boxes which can be stacked and are clearly labeled so you can always tell what you have in stock.

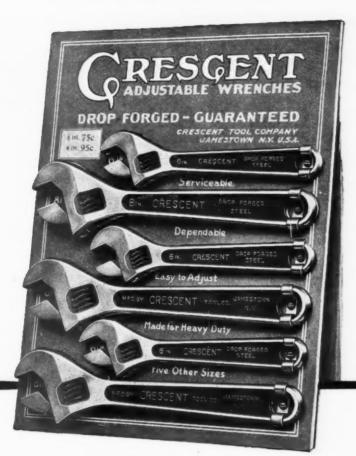
Ask your jobber's salesman about Johnson Standard Quality Automobile Bushings.

Johnson Bronze Co. New Castle, Pa.

JOHNSON BUSHINGS

, 1924





of CRESCENT WRENCHES



Here's a display board that will sell your accessory customers more CRESCENT WRENCHES for the same reason that Numbers DB7 and DB8 sell our Thin Nose and MOTOR KIT pliers in such quantities.

"Catch the eye and you catch the coin" is the slogan of garage men and accessory dealers who believe in making windows and counter space turn in their full quota of sales results. This new Crescent display board is a real eye-catcher.

Three 6-inch and three 8-inch Crescent Wrenches on an attractive 8½" x 11" display panel, at regular dealers' price for wrenches alone. No charge for display board. Ask your jobber.

The completely stocked accessory department has Crescent Wrenches, Crescent Pliers, Crescent T-type all-steel screw-drivers, and the Crescent Kit—all nationally advertised.

CRESCENT TOOL COMPANY

208 Harrison Street

Jamestown, N. Y.

Originators of the CRESCENT WRENCH

March

Ford and Chevrolet owners everywhere are watching dealer's windows for a good gas gauge.

And wouldn't you—if you were a Ford or Chevrolet owner? The Ford owner makes about eight moves to measure his gas. Save him at least six, with a Tasco Gas Gauge.

Fitting the threads of the old cap, the owner just lifts the seat and looks. Two moves! And he has an accurate measurement.

The cork float is well protected by a metal guard and the dial by a glass top. Threads fit perfectly.

Nothing to get out of order.

Chevrolet owners by replacing the old cap with a Tasco Gauge, also save a bit of time and temper.

Both gauges have been popular sellers and turn over quickly. Write for the discounts today and see your jobber about Tasco Gauges.

Akron-Selle Co.



A small stock—a quick turnover-

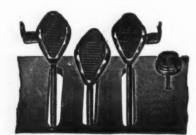
These two necessities together with a popular price make a sure-fire combination for the dealer and jobber.

Accompanying this display board are accelerator and Starter Pads in 12 assorted sizes with which you can equip any car manufactured during this and the past seven years.

Every make of car is provided for in these pads that sell for only 50c apiece. On your counter, this display board sells the goods. It nets you \$6.00 retail. Your discount is a liberal one.



From the lowest to the highes car, you can satisfy your cu with "Perfection Pedal Pads." well designed, of heavy corrubber set in Nickel Frames, tion pads require no bolts or to attach them. Just bend their snugly around the pedal—and is done.



New "D" Hook for Ford Cars \$1.00 per set.

Perfection Pedal Pads include a line so complete that you can supply every demand, with only 12 sizes.

There are Accelerator Extension Pedals—that bring the accelerator nearer the foot in any position—Extension Pedals which are adjustable to suit the varying foot and leg lengths of individual drivers—Special pads for Fords equipped with our Safety Hook—and individual pads for every make of car aside from those included with our Display Board.

"Perfection Pedal Pads" at your jobbers-all the time.

Auto Pedal Pad Company, Inc. 318-320 W. 52nd Street, New York City



Our New Accelerator Extension. Fits all cars. Gives ease and comfort. \$1.00.

"PERFECTION PEDAL PADS"

Insist on the pad with Nickel Frame

SHERER ACCESSORY CASE



Your
customer
never
buys
hidden
accessories—

Mr. Dealer, you know it! He buys his accessories behis eye has been caught by an effective, sales-compelling ay.

ense in carrying your accessories tucked away in a store or in a dark corner. They won't sell and selling is the that keeps the sweet music of the cash register sweet!

Easy to make "extra profit" sales—

Display these accessory profit makers in a Sherer. Speed up turnover—get the advantage of storage and display space—let them see 'em under glass—locked!—keep your stock in large storage drawers—handy to get at. A Sherer Case will make your "best seller" sell faster.

Send in the coupon today

SHERER-GILLETT CO.

17th & S. Clark Sts.

Chicago, Ill.

50% more display space

The neat features about the Sherer Case is that you get storage and display all in one.

Display is 50 per cent more than in any other case. No need to disturb your display because you store accessories in the large, easy-rolling drawers behind your display.

The display is easy for your customer to look at and the storage drawers easy for your salesman to get at. This means faster selling and more profits on accessory sales.

Mail it!

Sherer-Gillett Co.
17th & S. Clark Sts., Chicago.
Gentlemen: Your statement about the Sherer Counter which stores and displays Accessories, interests us. Please send particulars.

Name of Firm

Street

Mar



Here it is!

The Reliable Adjustable Crane and Auxiliary Winch

Look at the number of unusual features which this crane has:-

1. Beam instantly adjustable by a hand wheel to any angle. 2. Single, double or triple leverage through the pulleys, whatever leverage you need for the job. 3. Swivel pulleys on the nose, preventing the chain from running off the sheaves when pulley is at an angle. 4. Double truss rods giving additional strength and lifting capacity (2 tons). 5. Auxiliary winch easily attached with four bolts, equipped with 100 feet of cable (drum will hold 200 feet).

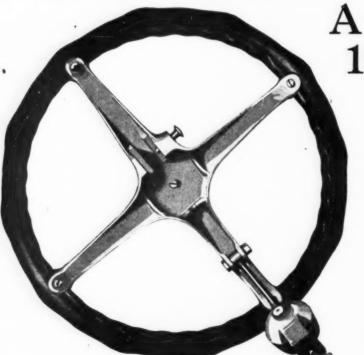
These 5 features make the Reliable just the all-round crane which you need for road and garage work. The Reliable can be mounted on any chassis. No special parts needed. Remove or insert four bolts and the crane is off or on your truck in two minutes.

Write for our catalog which gives you full details about this new crane. It's free. Send for it now.

ELITE MANUFACTURING CO.,

Dept. MA-4

Ashland, Ohio



A Lock Wheel 100% Efficient

Requires no key for locking—simply turn point of lock trigger over keyhole—pull outward and car is locked.

To unlock, insert key-turn once-and you're ready to drive away.

Rigid as a stationary wheel

When locked in position for driving, the Toledo Lock Wheel is as rigid and solid as iron.

It tilts so easily that the driver unconsciously uses its convenience when leaving car.

Easily installed in ten minutes-accepted by Insurance Underwriters—pays for itself in reduced insurance rates.

A big seller in a big field.

Send at once for Sample Wheel. Examine it. Test it. Convince yourself of the easy profits to be made. It's a big seller in a big field.

THE TOLEDO MFG. CO.

Toledo, Ohio

HE TOLEDO WHEEL



SCLONE HOISTS



A 350 lb. lift every 2 minutes

IN a certain Pittsburgh automobile assembly plant a Cyclone Hoist lifts a 350 lb. motor every two minutes throughout an 8 hour working day.

When we saw it in action it had been working steadily at this rate for 2 years.

It explains why hundreds of Cyclone Hoists have been sold to this automobile manufacturer.

It's clinching proof, too, why you should say Cyclones, when you next order chain hoists for your plant.

Distributors Everywhere. Send for catalog covering 1 to 40 Ton Hoists, Cranes, Trolleys, and Overhead Track Systems.

The Chisholm-Moore Mfg. Co. Cleveland, O.

Hoists Cranes Trolleys Overhead Track Systems

Branches: New York, Chicago, Pittsburgh

WATERVLIET SPIRAL EXPANSION REAMER

For Piston Pin Bushings on All Cars and Trucks

ONLY ONE OPERATION

The self cutting front pilot,—an original Watervliet development,—does the rough cutting. Spiral flutes do finish reaming only.

Thus, a perfect job is completed in one operation with a single tool;
— a perfectly round, true to size full bearing surface with a mirror-like finish.

True to a hair expansion for oversize work.

WILL NOT CHATTER

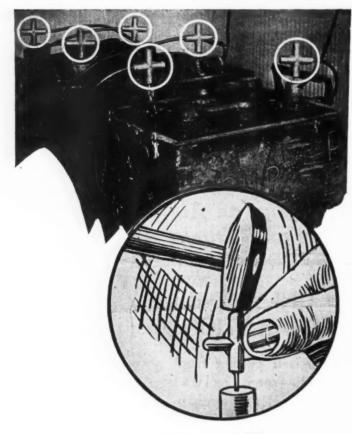
ASK YOUR JOBBER OR WRITE FOR LITERATURE

WATERVLIET TOOL CO., Inc.

1037 Broadway ALBANY, N. Y.

> New York 17-21 W. 60th St. San Francisco 661-665 Turk St.





New Low Prices

for Genuine Shuros

No need now to use any other kind. Genuine Shuros are now only \$1.80 a box. \$16.00 a hundred. Buy them from your jobber.

A tap with a hammer securely anchors the SHURO into the battery terminal—like a nail in a block of wood. A POSITIVE METAL-TO-METAL CONTACT.

Completely eliminates possibility of loose, high-resistance connections—always present with clips. When you want to remove it, a slight twist does it, instantly. Made to last—steel pins heavily lead-plated and hard-ened-acidproof. Each connector consists of two pins (crosses) and 15" of rubber-covered wire. SHURO is replacing the ordinary clip connectors everywhere. Give them a trial.

SHUR ()

BATTERY

THE BURTON-ROGERS COMPANY

Sales Department Hoyt Electrical Instruments

26 Brighton Ave., Boston, Mass.

Hoyt Instruments may be purchased from your jobber. Branch Offices and Distributors in all principal cities.



"The Bes Equipped Shop Gets the Bus



Here lies the Body Of old man Hobb But his Brunner Compressor Is still on the job

THE sad case of old man Hobb only goes to prove that while service men may come and go—a Brunner goes on indefinitely.

The Reasons-good design and good building.

A Brunner Compressor is built like a fine engine with close fitting parts precisely ground, assembled carefully and carefully tested.

Barring the possible necessity of certain replacements, say—once in five years—a Brunner is sure to give many years of uninterrupted service.

A Brunner starts quickly, runs silently, works fast, costs little to maintain, lasts long and is super safe.

All features made possible by good design and good building.

Ask for the Brunner Catalog.

Brunner Mfg. Co., Utica, N. Y.

Oldest and largest manufacturers of garage air compressors in the world.

BRANCH OFFICES: Cincinnati, Kansas City, San Francisco

EXPORT OFFICE: Utica



1924 Model 939 2 Stage Compressor

With 20 exclusive features, a few of which are:
Extra large intercooler.
Improved Belt Tightener.
Ground Contact surfaces.

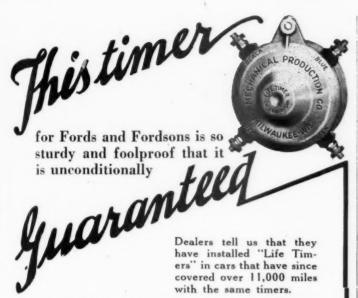
Removable Cylinders.
Removable Cylinders.
Forked-type Connecting
Rods—Minimizing vibration.
Every part built with special tools and gauges, insuring absolute interchangeability.

Seamless Steel Tank—insuring absolute safety.



Solderless Compression Couplings.

Brunner Patented No. 73 Safety Valve—Absolutely Air Tight.



As soon as you show this timer to any Ford owner, he will see the difference. Let him open the case and see the reversible commutator of heavy Bakelite, with plugs that go clear through; the rotor arm and its Tobin Bronze contact that works even if the cam shaft has end play or is wabbly—wiping millions of perfect contacts. Then tell him that the



needs no oil. Tell him that a stream of water doesn't short it; that he can put it on his car and forget it, for it will not fail him. Tell him that it is guaranteed and that it

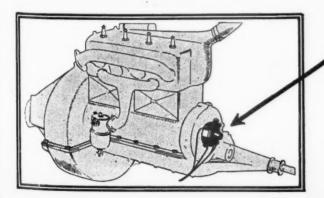
Sells for \$2.00

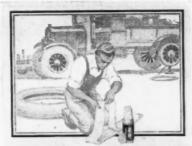
East of the Rockies

If this Life Timer is as good as we say it is, you want it. We will send illustrated folders, if you write for them. But the quickest way to profit by selling this fast moving timer is to place an order with your jobber for a trial display carton of twelve. If your jobber can't supply you, write us direct. Our guarantee protects you.

Additional production capacity enables us to give prompt shipment to an additional number of jobbers. Jobbers are invited to write for information and sample.

Mechanical Production Co. Milwaukee Wis., U. S. A.





Patch-Day, May 1

You'll have it when you need it if you buy it now



One of many display items in one of many special Las-Stik sales stunts.

Volume

Dealers and Jobbers handling Las-Stik have heard of this May 1st celebration through the mails and are preparing to cash in. Why not you, too?

Dealers and Jobbers, if you are not getting tube patch volume write us.

Our sales and advertising policy is based on the fact that Las-Stik repeats. Every user buys again and recommends the patch to others.

Counter displays and window trims pay Las-Stik dealers because they build permanent volume. If your tube patch volume did not increase at least 30% in '23 write us. Mention this ad. We can help you.

LAS-STIK PATCH MFG. CO.

Hamilton, Ohio





Selling trucks and buses is easier when you know the owner's viewpoint

Read Motor Transport

It tells you the problems of the Fleet Owner. It tells you how Fleet Owners are making and can make a success of truck or bus operation.

Just as *Motor Age* tells you how to handle your business, so *Motor Transport* tells how to efficiently operate fleets of motor trucks and buses.

Reading *Motor Transport* will make you a better dealer.

Recommend fleet owners to whom you have sold trucks or buses to subscribe for *Motor Transport*. This magazine will make them more efficient operators.

You will both benefit!

Motor Transport is published semimonthly, on the 1st and 15th. The subscription price is \$2.00 per year (\$2.50 West of the Mississippi).

Write for a sample copy.



(Published by the Class Journal Co.)

239 West 39th St.

New York, N. Y.

924

"MECHANICS" Oil Lubricated Universal Joint



Pays a mighty good profit, and ends further replacement. Lasts as long as the car, and requires lubricating only about once a year on the average. Can you think of anything better to sell?

Mechanics Machine Co.

Rockford, Ill.

Sample Sent FREE

of this great utility

KFY GRAPHITE PASTE

Made for the definite purpose of stopping all leaks and squeaks in Engine and Car.

The paste of a thousand uses. Every Service Station and every car owner should have it handy.



FOR GASKET SEALING

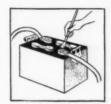


KEY PASTE makes a 100% tight joint when putting on cylinder head gaskets. You can use the gaskets. old gasket over and over

again.

Put KEY paste on spark plug threads to stop compression and oil leak.

FOR BATTERY **TERMINALS**



KEY PASTE stops corrosion at battery terminals. It is impervious to acid. Use it instead of grease or

vaseline.

Put KEY paste between spring leaves. Its graphite base makes smooth and permanent

FOR MANIFOLD **PAINTING**



KEY PASTE is heat proof. You can paint the manifold with it. Do it when manifold is cold—let dry—and you have a neat job. Rubbed down it has smooth

finish.

Put KEY paste on hose connections for perfect stay-tight and leak-proof joint.

KEY PASTE is not a cement. It will not score nor injure cylinder walls even after carbonizing. It is diluted with hot or cold water only. Heat does not

Key Boiler Equipment Co.

EAST ST. LOUIS, ILL.

FREE SAMPLE

Key Boiler Equipment Co., Inc., East St. Louis, Ill.

NAME

CITY .

STATE

BUSINESS

KEY **GRAPHITE PASTE**



AUTOMATIC GROWLER

for the speedy and accurate testing of armatures and field coils.

What any Mechanic can do with this:

Locate short circuits in individual armature coils.

Locate short circuits between two or more coils. Locate short circuits in commutator.

Locate loose leads in commutator.

Locate reversed coils.

Locate transposed leads in commutator.

Locate ground in coils or winding.

Locate grounds in commu-

Determine the lead of the winding.

Determine the kind of winding used, whether wave or lap.

Locate short circuits in field coils.

Locate open circuits in field coils.

Determine cause of overheating of armatures.

Bake out an armature in one-tenth the time required by other methods.



List Price

\$37.50



This shock absorber does not change in the least the operation of any part of the Ford car. The springs remain in exactly the same relative positions, and do the same work they do before the shock absorbers are put on. One model fits all Fords. Perches are not reversed or replaced. Body is raised only one-eighth inch—no danger of making car top-heavy. Can be adjusted to each individual car by turning one nut—an exclusive feature. No special tools needed to install—anyone can do it. Eliminates side-sway—checks rebound—saves tires.

Our proposition to dealers is very attractive. Write for details.

The Savidge Shock Absorber Co.

1310 South Walnut Street

Muncie, Indiana



Set of Four Only

\$13.50

The GOOD Drills! Powerful—Dependable "Not How Chean But How GOOD" Jacobs Chucks are regular equipment.

64 Sizes in the THOR Line

When you start out to buy an electric drill by all means consider quality above everything. Don't try to save money on it. What you are after is dependability of the tool under every condition. A hole is a hole no matter what drill makes it but there are a great variety of ways to make it. The THOR is the right way. If your dealer hasn't THOR write direct to us.

INDEPENDENT PNEUMATIC TOOL CO.

600 West Jackson Blyd. Chicago, Illinois 1463 Broadway New York City

Branch Offices Everywhere



The Genuine Is Easily Identified by the "Straight Line" Milling

Experienced toolmakers and machinists have for years known and used Almond Chucks.

Until now, most three-jaw chucks have "looked alike" unless examined closely, but in the development of the Almond "Straight Line" Chuck we have made it possible for you to distinguish a Genuine Almond at a glance.

T. R. Almond Mfg. Co. Ashburnham, Mass., U. S. A. Established 1873 124



SHIM, to take up all end play in Ford crank shaft bearings, you not only produce a BETTER job but you save yourself considerable time and make it easier, by far. No tedious scraping to fit. old bearing cap, which has hereto-fore been thrown away, is now, by use of The Oestern Shim, made to do the service of a new one.

Installed as End-Thrust collar



Crank-shaft adjustments are now easily, quickly and permanently made.

A full end-thrust bearing next to the fly-wheel (where all the thrust comes when operating in high gear) is absolutely insured and retained by the use of this End Thrust Collar.

> Price for single Shim 75c. List per doz. \$8.40. Liberal discounts to jobbers and dealers. If your jobber cannot supply you order direct from us or our sales representative Wadsworth Staff, 332 S. Michigan Ave., Chicago, Ill.

THE OESTERN CO. DUBUQUE, IOWA

Twenty-Four Hours a Day YOUR DAY at a Hotel passes from one extreme to another—from action to rest, or from rest LOCATION. For action, The Hollenden is at the business center of Cleveland, including all Railroad Stations, Interurbans, Bus lines and city cars. The new Federal Reserve Bank, Public Audi-torium, Post Office, the best stores, theatres, offices and Public CONVENTIONS. Every facility is provided for business ings: Private dining rooms, Suites, Halls, Lounges and the i Ball Room in Ohio. ROOMS. 800 large, comfortable, well furnished rooms are moderately priced and give a wide range of choice: 83 Rooms, hot had cold running water, \$2.50. 210 Rooms, single with oath, \$3.00.\$3.50. 192 Rooms, with bath, \$4.00. 160 Rooms, double with bath, \$5.00.\$6.00. 135 Rooms, large double with bath, \$6.00.\$7.00. Many Sample Rooms and Parlor Suites. \$7.00 up. RESTAURANTS. Four nationally famous restaurant with a delightful character and refined individuality. CAFETERIA. The first hotel cafeteria in Clevaland, ser Special Breaktasts, Luncheons and Dinners of Hollenden foo AUXILIARIES. Details of Conventions and bu direct supervision of the management. Social Direct of Shopping service and functions for women; Club b attractive prices: Table of hose Sunday dinners; Carl R den Quintette in the Crystal Dining Room. Reservations Invited Herman Mack, President In Cleveland-it's The

TRY AN "R-K-D" AT OUR RISK

Special Personal Offer to Dealers

The "R-K-D" has full and official approval of the Underwriters' Labora-

We want you personally to see and use the "R-K-D." Here is the biggest money-making opportunity you have had in years. The "R-K-D" Gas Gage tells you from the seat just how much gas is in the tank— makes it as easy to read the

how much gas is in the tank—
makes it as easy to read the
gas in the tank as the miles
on the speedometer.
In conjunction with your
speedometer the "R-K-D" also
shows you how many miles the
motor is giving per gallon of
gas, what gas burns best and
how the engine is running.
Special Price to You—With
Money Back Guarantee
The R-K-D is a brand new ac-

The R-K-D is a brand new accessory—easy to install and requiring no service. Electrically

operated. Retails for \$8.50. Simply send us the make and model of your car with a check or money-order for \$5.95 and we will send you an "R-K-D" by return mail.

Put the "R-K-D" on your own car. See how simple it is to install. Give the "R-K-D" a good hard test. Then, if you like it and think you can sell the "R-K-D" to your customers, keep it. If you don't like it, send it back, without any obligation to yourself and we will refund your money at once. You can sell dozens of these gages by merely letting people know you have them.

We furnish profit making ad-

know you have them. We furnish profit making advertising and sales helps free.

THE REITER-KING-DUGAN COMPANY





Profit-makers that take no vacation

Once they were called "mud-guards," now they are known as fenders. Perhaps because they take such abuse and suffer damage in general.

Half the cars in the country are Fords and the volume of fender replacements this represented is potential, profitable business for vou.

Stock Peerless Fenders-the bright black beauties-the strong sturdy replacements that give the Ford owner lasting service. They appeal to his eye, please him on price and pull the profits for you.

Made of 20-gauge full finished steel, with two coats of hard baked enamel. A quality job throughout. Big sellers all year round. Better sellers than others because we back you up and give live and consistent sales assistance

THE CORCORAN MFG. CO. CINCINNATI, OHIO

PEERLESS FENDERS for Ford Cars

Narrow Valve Seats Pay Well

They give quicker pick-up and more power. Customers are glad to pay a little extra for a valve-grinding job which gives those results.

That's why you should have a Lipe Counter-borer.

gives narrow valve seats in a few minutes, with

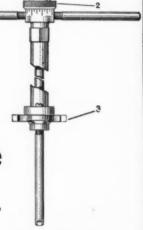
little labor, on any engine. The tool that will do that is the tool that pays for tiself quickly and returns big profits afterward. It comes complete; no extras to buy. It adjusts before or after being put on the work. Add one to your kit and make many times its cost, soon.

Adjustable Valve Seat

Counterborer \$10.00 complete

R. N. Roach Co.

Rialto Bldg., San Francisco, Cal.



1 Knurled Locking Nut 2 Adjustable Cutter Control 3 Cutters 1% to 2% expansion

31 for installation





A Stop Lamp That Will Start Bigger Sales

The safe and sane operation of motor cars makes stop signals a necessity.

But in buying such equipment the motorist wants assurance that it can be relied upon—that it will function under all conditions and be simple to install. The lamp must be rugged enough to stand jolts and vibration. It must be of weatherproof design, with protection against rust. Attractive finish is equally important in appeal to the car owner.

Like all items in the Victor Quality Line the No. 31 Stop Lamp meets the demand of the modern motorist. It provides the dealer with merchan-dise that has a rapid turnover and an attractive margin of profit.

Furnished complete with switch and wiring, ready to install.

Write today for our catalog.

The Cincinnati Victor Co.,

714 Reading Road, Cincinnati, Ohio



STOP LAMPS

It's all in the Metal

As soon as the ring under a reg ular piston ring loses its tension it is worthless. Efficiency lies in the metal.

G-H Tension Rings made of the finest grade of steel tempered by our own special process retain their original tension almost indefi-

Which means that they not only make but keep all motors running and sounding

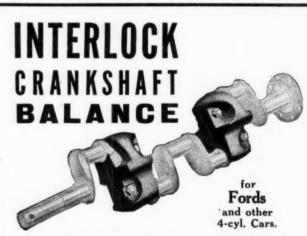
like new. G-H TENSION BANGS

G-H Tension Rings, fitting under the regular rings, automatically centralize the piston and stop oil pumping and piston slap. Power, speed, silence, economical operation are restored.

Don't rebore—use G-H Tension Rings. They're easy to install and profitable. Absolutely Guaranteed. One size fits 90% of all cars. Specify width when ordering. Retail price 20c each.

G-H TENSION RING CO., Inc., Armory Place and Howard St. BALTIMORE, MD.

Retain their Resiliency



\$10 and one hour's time makes a FORD Car or Truck (or \$11 for other 4-cylinder motors) as vibrationless as many a good SIX. Puts crankshafts in DYNAMIC BALANCE. Crawl along in "high" without bucking. Eliminates periods of vibration. Makes motors smooth at ALL speeds. Saves wear on hearings. Counter-weights IN-Saves wear on bearings. Counter-weights IN-TERLOCK—no strain on holding bolts. Im-possible for them to loosen. Take off crankcase cover and apply with a wrench. Not an experiment. Big success wherever used.

AT THE PRICE, EVERY MOTORIST WANTS THEM INSTALLED. Big opportunity for dealers. Write for

Manufactured by

THE READING SALES CORP.

300 Hollenbach Street

Reading, Penna.

1924



CRÂNE WHEELEGEAR PULLER

Makes buying easy

No stunt now, to pick the right wheel-puller for your particular work. See them ALL on this Crane Puller rack. Two styles—two-arm and crowfoot—four sizes of each. All good jobbers are showing this-rack—look for it at yours.

JOBBERS: This is the greatest aid to wheel-puller sales ever. Sales are doubling and tripling in some localities. Don't fail to get one or more of these racks. They cost you NOTHING. Write.

Crane Puller Co.,

Arlington, Mass.

WAYNE Cylinder Reboring Machine

More Profits for Repair Shops

Handle those cylinder reboring jobs on this highly efficient machine and save time, with a consequent increase of profit on each job.

You can give accurate estimates on reboring jobs with this machine. Many testimonial letters from users bear out our statement that it is profit making equipment

bear out our statement that it is profit making equipment.

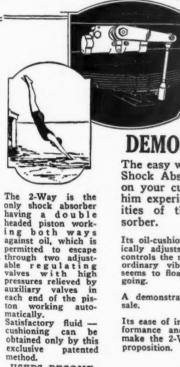
With the Wayne you can handle 95% of the jobs without removing the block. Bores any car, truck, tractor or engine cylinder, within a range of 2½" to 5-1/16" dia. Can be driven by hand, small motor or electric drill. Bores absolutely square with face of block. Will not follow cylinder which is out of line.

follow cylinder which is out of line. Easy to set up. Change from slow to fast speed can be made without stopping machine. Packed in heavy oak case with complete instructions.

Write for descriptive circular now!

Wayne Tool Mfg. Co. Waynesboro, Pa.





SELLS ON DEMONSTRATION

The easy way to sell the 2-Way Shock Absorber is to put one on your customer's car and let him experience the riding qualities of this super-shock absorber.

Its oil-cushioning mechanism automatically adjusts itself to road shocks—controls the most violent rebounds and ordinary vibration—so that the car seems to float over even the roughest proing.

A demonstration practically means a sale.

Its ease of installation—wonderful performance and record of achievement make the 2-Way an exceptionally fine proposition. Distributors wanted.

Write today

AUTO SPRING CONTROL CO.

Jamestown, New York

HYDRAULIC SHOCK ABSORBERS



A . 100% Perfect Tire Changing Tool Sold with a Money Back Guarantee

ADJUSTABLE, casehardened, corrugated grips clamped on rim by wing nut, which absolutely cannot slip, bend, kink or harm the rim.

or harm the rim.

A B S O L U T E ASSURANCE of being able to handle any rim, even the worst battered and bent

ADJUSTABLE to all makes and sizes of demountable split rims. SIMPLICITY of operation coupled with strength and lasting durability. Send for your service rim tool. It is waiting.

Service Mfg. Co., Elkhart, Indiana.

Mai

HELP YOUR CUSTOMERS

TO FORGET THEIR CHAIN TROUBLES

HELP YOURSELF

TO MORE CUSTOMERS AND MORE PROFITS

By Installing Only

"WHITNEY" HIGH MILEAGE CHAINS

FOR REPLACEMENTS

There are over 2,000,000 "Whitney" chains on the road today. Over 1,000,000 "Whitney" chains have been installed as original equipment on one well known make of car. Over 60,000 "Whitney" chains have been installed for replacements on the camshaft drive of one prominent motor although not used as original equipment on this car.

It is the GREATER MILEAGE that does it.

THE WHITNEY MFG. CO. HARTFORD, CONN.

New York
L. C. Biglow & Co.,
Inc.
243 West 55th St.

Boston George C. Steil 740 Commonwealth Ave.

Philadelphia R. J. Howison 624 Race St.

San Francisco A. H. Coates Co. 615 Howard St.

Seattle A. H. Coates Co 1115 E. Union S



ONLY ONE DEVICE WILL SAFELY STOP PISTON SLAP

and oil pumping and you can satisfy customers in getting rid of fouled plugs, quick carbonization and sluggish, expensive motor operation. Get back renewed power, flexibility, compression and a big gas and oil saving. No reboring necessary. The "Apex" are ready sized and shaped for use.

GENUINE APEX INNERINGS

(INSIDE PISTON RINGS)

Installations have been developed by thousands of garages to a vastly profitable volume, for owners have been educated to demand this more economical, more effective, guaranteed method of repowering. This exclusive, scientific method of manufacture alone permits economical and always effective jobs. Substitutes cut from soll

tive jobs. Substitutes, cut from rolls poorly designed, carelessly sized mean heavy installation expense and customer ill-will.

DEALERS-JOBBERS

Get attractive facts now—it is paying hundreds of other houses.

THOMSON MFG. CO.
PEORIA Dept. C ILLINOIS
(Successors to Thomson-Friedlob Mfg. Co.)



Watch for the Jobber's Salesman

He's got a bargain tor you—a \$15.00 profit clean-tied up in a box of Peck's Improved Assortment of Springs specially selected for garage

This box costs you \$5.00 and its contents will net you \$20.00 minimum. For repair work, this box of ready springs can't be beat.

\$15.00 profit in every box. Watch for the jobber's salesman. If he doesn't get there—WRITE to your jobber.

Get that \$15.00 profit.

The Peck Spring Co., PLAINVILLE, CONN.

Protection!

Dealers:-

RETAIL PRICE

20c

each up to % wide or 5' diam. Larger 35c. Insist on the exclusive Thomson Guarantee Tag in ordering. It protects you against mitations & guarantees results.

New Era Bumpers are guaranteed for life. This sells them on sight. Our discounts and low prices will build a profitable business for you.

New Era Spring Specialty Co. Smalley Daniels, Pres. Grand Rapids, Michigan



juaranteed!

THEN ALL advertisers demand their money's worth, all publications will provide circulation reports verified by the Audit Bureau of Circulations.

It is one of the mysteries of the advertising world that while all manufacturers demand verification of weight and quality in the material purchased, some of them still buy advertising space without knowing what they are paying for.

Such advertisers, however, are now exceptional. Most of them demand verified A. B. C. circulation statements before placing contracts.

In the case of Motor Age, the demand is immediately met.

It is a member of the Audit Bureau of Circulations.

New and Low Priced



Splendid Values
Big Profits

High Grade

Pure Cast Aluminum

Step Plates



Made by the Manufacturers of the Famous



Samples and Prices Upon Request

THE OHIO PARTS CO.

3305 Colerain Ave.,

Cincinnati, O.



Any Light for Illumination AUTO-PAS for Safety

No other light possesses the wide range of night driving securities provided by



(Made in California)

No other light so quickly and dominantly gets the right of way, for its three-way light rays are always recognized and obeyed. Installed on the left running board, the green light of AUTO-

PAS prevents side-swiping and collision, while the red light behind and the white light on the road, shows exact safety clearance to passing cars.

\$7.50 provides this protection.

Mail your check to

J. F. BUTTS

207-D Alaska Commercial Bldg. San Francisco, California



DEALERS:—Write for full particulars and literature. "The Light that says Safe Here." Regardless of what you are handling it will pay you to investigate "AUTO-PAS SAFETY LIGHT"

Every Good Shop Should Own An Allen Universal Test Stand

Your Jobber will tell you that this is the finest and most complete piece of electrical testing equipment made.

Ask for catalog.

ALLEN ELECTRIC MFG. CO.

2204 W. Fort Street, Detroit, Mich.



eir

ride

eau

rld

of

hat

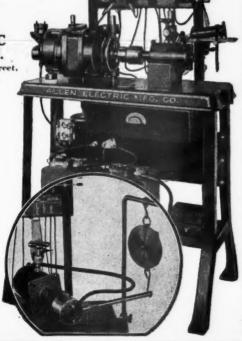
nal.

ate-

me-

ons.

Torque Test Included





SAFETY Front Wheel Brakes

Can be attached to ANY MAKE of car. Wonderful overhaul opportunity as every motorist wants to be up-to-date. Operates from the regular brake-pedal. Permits any car to stop in less than HALF THE DISTANCE required with rear wheel brakes alone. Safety feature appeals to all—especially women-drivers. Absolutely no danger of skidding.

Don't pass this up. It is one of the biggest money-making opportunities you will have this year. Write us NOW about this. Big discounts.

GREEN ENGINEERING COMPANY

740 MAIN ST., DAYTON, O.

Distributors for Front Wheel Brakes eaty. H. F. Morgan, Tamps, Fla; Reid Air Spring Sales Co., Pittsburgh, Pa.; Clarion Buick Co., Clarica, Pa.; Kittanning Buick Co., Victoration, Pa. T. Whitel Sta Pedro, Cal.; Walker Auto Supply Co., New Kansington, Pa.; John J. Schiffmacher, Brooklyn, N. Y.; John B. Mesey, New York City; McCarthy Broa., Inc., Philadelable.

Magneto Attachments for All Ford Models



Equip your Ford with our dependable High Tension Magneto Attachment

Pat. Magnetos sold separately Saves 35% in Gas

Model A



Manufactured by

HParkin Magneto Co. 325-27 N. Fifteenth Street, Philadelphia, Pa.

The Bearings Company of America



Your present Thrust Bearings sizes duplicated. Thrust Ball Bearings made to your B/P's. Quotations made promptly on all inquiries.

THE BEARINGS COMPANY OF AMERICA, Lancaster, Pa. Western Sales Office, 1012 Ford Bldg., Detroit, Mich.

BLACK & DEC THE BLACK & DECKER MFG. CO. Towson, Md.

CHNSON No. 8 Adjustable Torch

Will melt 25 lbs. of soft metal, heat soldering coppers, preheat any metal parts, or the burner can be adjusted to any angle or removed entirely and used as a hand torch for pre-heating, burning paint, etc.

Write for complete catalog.



New York Office, 277 La Fayette St.

MORE PROFITS--SATISFIED CUSTOMERS



You, and every other dealer, jobber or repairman, want more profits, and more steady customers — the kind that always come to you. Boyle Valves will bring you both. Tell your customers what these valves will do and the sales will take care of themselves.

BOYLE Never Grind VALVE

Boyle Never-Grind, Silent Valves run from 50,000 to 100,000 miles without grinding, operate silently, and are guaranteed. Those are some of the points that make them fast sellers. Write for further particulars, and for our profitable distribution plan.

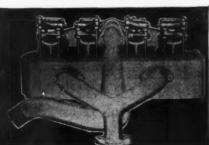
BOYLE VALVE CO., 2101 LARRABEE ST., CHICAGO

Here Are the Reasons Why You Can Guarantee Our Plates

GENERAL plates are strong and porous; they deliver the current whenever called upon. No chipping out and softening for them,—regular users will tell you that. Write today for in-formation about long-life GENERAL plates or any other battery parts you may need.

General Storage Battery Co. 2005 LOCUST ST. ST. LOUIS, MO.

ROOF 16 OVERHEAD VALVE EQUIPMENT For Ford and Dodge Motors **ROOF 8 VALVE HEAD FOR FORD MOTOR**



Stupendous Power-Lightning Speed

Lightning Speed
Ford racing cars with
Ford racing cars with
Ford Facipinent are rivals
on mile and one half mile
tracks of the highest priced
racing cars. Doubles the
pulling power of the Ford
or Dodge pleasure car of
truck. Hill climbing and
general road work beyond
wildest dreams of the
owner. Complete — ready
for installation — no machine work necessary.
We are headquarters for
sall speed equipment. No
matter what you want.
write us. Racing quality
—lowest prices. A postal
card brings you complete
list of our specialties.

THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA

Every Ford Owner Needs This Wrench In His Tool Kit

When spark plugs are rusted in, it takes a good wrench to remove them. We will guar-antee our 3620 to do this trick. (3620

"Shop Talk

on Plates" Let us send you this interesting

The 3620 can be used on cylinder head bolts and will get the two under the dash. You can use it on water connections and other parts.

Show this number 3620 to every Ford owner, it will make sales, show you a good profit and be a fast seller.

WALDEN-WORCESTER WORCESTER, MASSACHUSETTS



7, 1924

ica

, Pa. h.

etal. any

be

rch

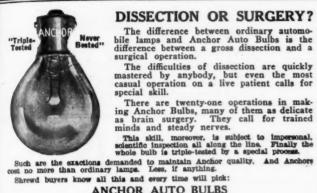
etc.

hy

tes

MO.

N ER ES



DISSECTION OR SURGERY?

The difference between ordinary automobile lamps and Anchor Auto Bulbs is the difference between a gross dissection and a surgical operation.

The difficulties of dissection are quickly mastered by anybody, but even the most casual operation on a live patient calls for special skill.

ANCHOR AUTO BULBS

Anchor Electric Company, 555 Jackson Blvd., Chicago, Ill.

You get quality work, SAE specification materials, and the right price if you send your connecting rods to a Watkins plant for rebuilding and refuse imitations of



New bolts and nuts, laminated shims, new piston pin bushing are part of the rod rebuilding at no extra charge.

New Bearing tinned in the rod and broached to mirror finish fits quickly to crankshaft and cuts time on flat rate repair jobs. Practice sending your rods in regularly. There's profit in it.

REBABBITTING SERVICE "One Day Service from

factory nearest you"

factory nearest you"

Hartford, Conn., Ripley Motor Services indianapolis, Ind., Indiana Watkins Mfg. Co. (Co. Kingston, Ont., Watkins Mfg. Co. of Canada. Ltd.

Los Angeles, Cailf., Miller & McIntyre Memphis, Tenn., J. B. Cook Auto Co. New York, N. Y., Lake Sales Co. Omaha, Nebr., Interstate Machinery & Supply Co.

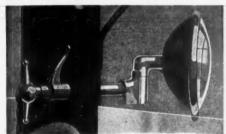
St. Louis, Mo., H. & H. Mach. Co. Syracuse, N. Y., Watkins Mfg. Co. of New York
Toledo, Ohlo, Stewart-Burgan Co. Washington, D. C., R-L. Motive Parts, Inc.

Inc.
Waterloo, Ia., All States Rebabbitting
Service.
Wichita, Kans., Home Office—The Watkins
Mfg. Co.

Sells Whenever You Show It

Because it is a handsome piece of equipment—because the control is conveniently located—because the spotlight is always in place ready for use whether the windshield is open or closed. Made for open and closed cars.

PFAFF SPOTLIGHT Inner Control



Will sell wher-ever there are

ever there are car owners. Any-one can install it by drilling a %" hole in the cor-ner post.

PEAFF MEG. CO. 6340 Stewart Ave., Chicago

ARMATURE REWINDING

Experts in The Business



and Service Guaranteed

1000 SATISFIED CUSTOMERS

Are You One of Them? Save Money by Becoming One ...\$1.50

Fords Generators all other makes ..

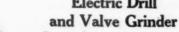
DO IT NOW-DON'T DELAY

Write for particulars

PIONEER ARMATURE CO., Inc.
Chicago, Ill.

2805 Cottage Grove Ave.

Get This "Pioneer" Garage Special **Electric Drill**





Greatest time and money saver, as well as money maker, for your shop-

"It Will Do The Work"

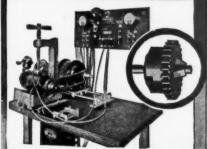
Louisville Electric Mfg. Co.

Incorporated Louisville, Ky., U. S. A.
C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

New !

EXCELSIOR TEST BENCH

With the Positive Drive and Speed Control



INCREASE YOUR PROFITS!

Starting, lighting and ignition pays bigger profits than any other branch of automotive service.

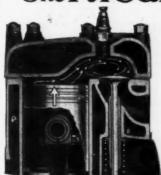
The Excelsion **Test Bench**

quips your shop com-plete for this work.

Price \$385.00 Payable \$50 per month Write for bulletin 975M

WEIDENHOFF CHICAGO, HL. U.S. A

The Ricardo Head



produces more power and effects greater economy than is possible with a standard type of engine.

All Waukesha Motors are now equipped with the Ricardo Head.

WAUKESHA

Motor Company ENGINE BUILDERS Waukesha, Wisconsin

Detroit

AIR-O-METER

The Air-O-Meter not only brings new customers but

keeps them coming. It delivers free air to the correct pressure AUTOMATICALLY. Write for full information today. THE MATTMAN & SINCLAIR CO.

CINCINNATI, OHIO

FEDERALBUMPERS

Beauty and ruggedness combined—made in two styles:
—the Metropolitan with one piece pressed steel front;
and the Broadway double spring bar model.

Catalog No. 11 malled on request

FEDERAL PRESSED STEEL CO.
Jobbing Division:—London Guarantee & Accident Bidg., Chicago

YOU can handle this body PROFITABLY



All steel construction provides lightweight with extreme strength. Outlast chassis.
One design fills most light truck user's requirements.
Ton and Half-ton sizes.
Shipped knocked down. Low priced. Distributor and dealer terms liberal. Write.
Huntington, W. Va.



Flower City Self Closing Chain Links

No tools required. Weight of car closes and locks. Repairs in-stantly.

Price, 10 links in box, 25c
Write for prices, samples and discounts

Flower City Specialty Co. Rochester, N. Y.

Pat. Dec. 12, 1922

ROME-TURNEY RADIATOR SERVICE

Honeycomb and tubular replacement cores, Radiators and parts for all cars and trucks.

One-day service. Dealers find our agency profitable. Write for our plan

Rome-Turney Radiator Co.

Service Dept., Rome, N.Y.

IMPERIAL

"Fits-All" Pure Aluminum Step Plates

Only one made that perfectly fits all makes of cars—Biggest seller of the year!

Imperial Brass Mfg. Co., 1217 W. Harrison St., Chicago, Ill.

THE WESTCOTT MOTOR CAR **COMPANY**

SPRINGFIELD, OHIO



USE THE AMMCO

Cylinder Re-Conditioning Tool

Regrinds and refinishes cylinder bores. It is self-adjusting, self-aligning and self-centering. Write for Bulletin.

Automotive Maintenance Machinery

551 W. Washington St. Chicago

IGH USTRE TINISH

For Everything Varnished or Enameled Automobiles, Pianos, Furniture

H. L. FEASEL'S LABORATORY

9-11-13 Desbrosses St., New York, N. Y.

EMINGTO AUXILIARY

GASOLINE RESERVE FOR FORDS

Ask Your Jobber or Write Us. REMINGTON AUTOMOTIVE CORPORATION New York, N. Y. 17 West 60th St.

The Man Who Owns It Never Runs Out of Gas

LA ROSE AIR STABALIZER

A device which makes "Damp Evenings" all the time. It moistens the air, also clears it before entering the carburetor. Simple, efficient, no moving parts, an air cleaner, easy to install, increases mileage, eliminates carbon, lasts a lifetime. Write for particulars, prices and discounts.

Lasco Corporation, Niagara Falls, N. Y.

The New

MOTOR TRUCKS

ONE TON

TWO TON

THREE TON

Bethlehem Motors Corp. of N. Y. Factory, Allentown, Pa.

BEARINGS

Now offering both the matchless Peerless Eight and the Superb Peerless Six

C. & G. WHEEL PULLER

Pulls only on the hub. Does not touch brake drum or spokes. Can't strip threads. One puller with two ADAPTERS fit 24 cars. Other adapters as needed. The greatest little puller you ever saw. Write for prices and literature. Guaranteed for year. Satisfaction or money back.

C. & G. WHEEL PULLER CO., Wellsville, N. Y.

3,000 Dealers Make Bigger Profits



It will pay you to investigate **GUARANTEED** 18 MONTHS

COLE BATTERY SALES CORP. 2435-39 Indiana Ave.

7, 1924

uns

ut

N

a.

The Norwesco Hookup

Watch for details later

The Northwestern Chemical Co. MARIETTA, OHIO

DILL **INSTANT-ONS**

Dust and Valve Cap Off or On in 5 Seconds

The Dill Manufacturing Co.

Cleveland, O.

Let us manufacture and serve your air with our

20th Century

Air Compressors and Air and Water Stations GASCO MANUFACTURING COMPANY

General Sales Office 25 Church Street, Room 912 New York City

Plant Located at Lancaster, Penna.



CRANK PIN RE-TURNING TOOL



The Auto Hone Co., Buffalo, N. Y.

The "WHITE" Valve Grinder—\$2.00 Retail

Repairmen say it does finest work. Has no complicated parts, de-livers power exactly over the center and can be controlled perfectly. Reaches valves ordinarily inaccessible. Liberal discount. Ask

American Motor Products Corp., South Bend, Ind.

Helmet Products

Stock the real quality line of signal lamps, parking lights, etc. Our fixtures are distinctly different. All made of rugged DURALIUM castings—beautiful, practical, made to last. Our Ad-Lite is a big feature. Write for details today.

WILLIAMSON-BEACH CO., 882 Park Ave., Baltimore, Md.

A VACUUM GAS FEED AND **EMERGENCY RESERVE** COMBINED

For Ford Cars and Trucks

Mountain Accessory Co.

Emporium, Penna.







The Double Lock for Spare Tire
Offers fullest measure of protection. You can sell it
with credit to your store, at a satisfactory profit.

Write to the Winterfront factory for prices.

PINES MFG. CO.
404-10 N. Sacramento Blvd., Chicago, Ill.

Only Packard Can Build a **Packard**

UNIVERSAL BATTERIES

Parts for all makes of batteries.

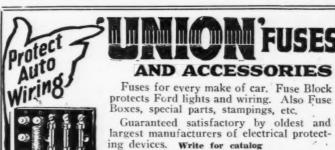
SHOP EQUIPMENT

Send for 1924 catalog-now ready.

UNIVERSAL BATTERY CO.

3422 SO. LASALLE ST.

CHICAGO, ILL.



FORD FUSE BLOCK Chicago

CHICAGO FUSE MFG. CO. New York







MONEY MAKING MACHINES

STORMIZING machines are truly money makers. They enable you to make biggest profits on every overhaul job. They handle all your cylinder renewing, accurately and the high quality work that wins your customers' lasting approval. The automatic time and labor saving features make big profits possible hydroxime acceptance. sible by lowering operation costs.

Write for the Storm Book, "Modern Cylinder Methods"

MFG. CO.

406 A Sixth Ave. So.

Minneapolis

Paterson, N. J.

GAYLORD LITTLE GIANT

Vater S

MATICALLY. Self-operatorder. Made of brass; he

THE GAYLORD MFG. CO.

25% increased mileage

Big Reduction in Gas Consumption

20 to 25% increase in mileage through F-J Quick Gas Analyzer developed by U. S. Bureau of Mines. Wonder-ful money-maker. Costs \$27.50. Pays for itself in a week. Write at once for details.

Burrell Technical Supply Co., Pittsburgh, Pa.

>"CONNEAUT"←

Plastic Metallic Packing

Patented Stops the leaks in automobile water pumps. Mold it with your fingers. Makes a smooth metal bearing—adjustable and practically frictionless. At your Jobbers—Get it today. It does the trick. Put up in 1 lb. cans. If your Jobber doesn't carry it, write us direct. Price \$1.65 per pound, f. o. b. Conneaut, Ohio.

Dealers Every

INSIST UPON



Over a In Use

The Original

SILENT TIMING GEARS

Made of CELORON

Dalton & Balch, Inc.

2333 Michigan Ave., Chicago



Cyclo "Dynamic" Hot-Spot for Fords

This "Modified Vapor" manifold gives a gas with lots of "kick" in it for hill-climbing — exceptionally smooth running and economical at all seasons. Vacuum control varies the heating inversely with the load. The best permanent proposition for dealers.

CYCLO MANIFOLD CO.

High & Chestnut, Akron, Ohio

MIRIFIK

CUTS SERVICE COSTS

A New, Safe and Efficient System of Cleaning Parts

of America

Write for Details

LAVO COMPANY

MILWAUKEE

WISCONSIN



Radiator Cover

With bandy hook, Hooks easily, Can't loosen. Top mateloosen. Top material or enamel drill. As shown and Drum Type.

Tyson Mrg. Co., Lock Haven, Pa.



TYSON

Fits Core only.
Best weather-proof
materials. Ford
size \$3. Average
all other cars, \$4.
Write for discounts.



A MONEY MAKER FOR

The Conneaut Packing Company

JOBBERS DEALERS DISTRIBUTORS
When a car owner sees this piece of equipment he
wants it—he realizes what a great convenience it will
be. This accounts for the record breaking sales now
being made.

DUPLEX

being made.

DUPLEX

Second Spare Tire Carrier and Rim Tool carries second spare-locks both spares against theft—attached or removed without tools—tires cannot chafe—ontracts and expands rim when changing tires. Only one size to stock for all cars. Write for details.

TRIPP-SECORD & CO., 606 Kerr Bidg., Detroit

AXLES



Conneaut, Ohio

PYROLITE STOP SIGNALS

High in Quality-Low in Price Get Our Plan

Steinberg Products Co. St. Louis, Mo. 3146 Olive St.



The Greatest Car We Ever Built The 1924

FRANK

Wheels

Get Samples

WATER PUMP FOR FORDS

POSITIVE WATER CIRCULATION Keeps them cool in Summer-A Winter Necessity

"CIRCULEX"
The only pump that seals water from bearing,
tumps 12 gallons water per minute at 18 M.P.H.
Price—complete with belt—\$3.90

PRICE BROS., FREDERICK, MD.



for Spare Tires and Sell one with every car

The Oakes Co., Indianapolis, Ind.



Start Making Big Profits CHARGING BATTERIES

H-B 8 HOUR CHARGING PAYS FOR ITSELF

Small cash payment puts HB 8-Hour Battery Charger in your shop. Your increased profits easily carry the small \$20 monthly terms, with good surplus besides. HB 8-Hour service builds trade, beats competition. An HB saves you \$35 to \$115 over any other outfit on purchase price alone.

HOBART BROS. CO., Box AR324, Troy, Ohlo

Look for our advertisement of

Climax Pressed Steel Muffler Cut-Out

in Motor Age Summer Service Number May 15th

The Unbreakable Motor Testing Valve

1827 San Fernando Road

Los Angeles, Cal.



STEERING KNUCKLE BOLTS AND BUSHINGS PISTON PINS, PISTON PIN SET SCREWS

Automotive Division

KING SEWING MACHINE CO.
BUFFALO, N.Y. BRIDGEBURG, ONT., CAN.

1924

J.

HOLLEY



140 Combinations all in this ONE set

Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.

The Eastern Machine Screw Corp. 10-20 Barclay Street, New Haven, Conn.

THE QUINCY SILENT AIR-MASTER

The Most Air Per Dollar Cost WALL PUMP & COMPRESSOR CO. Quincy, Ill., U. S. A.



lood · Imes

plete information.
WOOD-IMES MFG. CO., MINNEAPOLIS, MINN.
Formerly Mid-West Mfg. Co.

Meachem Gear Rings for Fly Wheels

Quality rings at lowest prices. Get our list.

MEACHEM GEAR CORPORATION

Syracuse, N. Y.



TEST YOUR BATTERIES

by the Chart Method. Something New. Send for free booklet, today,

Allen-Bradley Ca.

Electric Controlling Apparatus Milwaukee, Wis,

281 Greenfield Ave.,

TESTBESTOS Automobile Brake Lining

Manufactured by

AMERICAN ASBESTOS COMPANY Norristown, Pa., U. S. A.





THE TOLEDO STEEL PRODUCTS COMPANY . TOLEDO .O



ADJUSTABLE BEARING CO., Inc.

EQUIPMENT To Help You Sell

WRITE FOR INFORMATION ABOUT THE SALESMAN'S WORK BOOK

SALES EQUIPMENT COMPANY

FRONTENAC CYLINDER HEADS

and FRONTY-FORDS



The remarkable showing of the Fronty-Ford in the 500-Mile Race at Indianapolis May 30 was due solely to the performance of the Frontenac Cylinder Head. This Head is adapted for use on your Ford car by its designer and builder, Arthur Chevrolet. Write for FREE Catalog. Book, "How to Build a Fronty-Ford," \$2.00; free with orders of \$50.00 or

CHEVROLET BROS. MFG. CO., 410 W. 10th St., INDIANAPOLIS

\$17.50 COLONIAL CYLINDER HONES \$17.50 PRICES REDUCED ONE HALF

You can now buy the Colonial Cylinder Hone, an approved tool for this class of work and one of the best Hones on the market at \$17.50 each F. O. B. Kalamazoo, Made in three sizes, one, two and three, No. 1 2½ " to 3½", No. 2 3½ " to 3½" bore, No. 3 3¾ " to 4¾ ". Colonial Cylinder Hones are now being used by some of the best factory Service Stations in the country as well as by numerous Service Station Owners.

Colonial Gear & Manufacturing Co., Kalamazoo, Mich.

Fly-Wheel GearBands

Huetter Machine & Tool Co.
Indianapolis, Ind.



the Solution of the used car problem!

> Percy Chamberlain Associates 1320 Book Bldg., Detroit



EXHAUST HEATER

Attractive in appearance, with cleaning features of removable heating coil with no connecting joints inside the heater pan to leak. Meets instant approval. No odor on noise. Easily installed and operated. Will boost your winter sales—get our attractive trade proposalion.

NORWALK AUTO PARTS CO.



Bumpers for all Cars The Price and Quality Satisfy

Complete Catalog on Request

GEMCO MANUFACTURING CO. 760 So. Pierce St, Milwaukee, Wis



"Detroit" Tire Lock Sells On Sight

\$5.00 Neat and business-like in appearance, this Yale or Corbin type lock can not be picked. The wedge is so designed that it can not be twisted or broken. Handsomely finished in black enamel, the entire lock resists water, oil, grit and dust. Locked on or taken off instantly. Retail price \$5.00.

Write for literature and discounts

DETROIT CARRIER & MFG. CO., Detroit, Mich.

Over 100,000,000

TIMER Tepered

ROLLER BEARINGS

Have Been Manufactured

We're Telling Millions about DUTCH BRAND Friction Tape and Motor Aids

Next Copy, Saturday Evening Post, April 19 —and right along all the year.

Ask Your Jobber
VAN CLEEF BROS., Manufacturers
Woodlawn Ave., 77th to 78th Sts., Chicago

CYLINDER HEAD GASKETS

Heat-proof Gas-proof Can't blow out Retain their life
Oil-proof Water-proof Last longer Keep customers sold
One for every standard make of car, truck and tractor. The Fitzgerald Mfg. Co., Torrington, Conn.

We can prove to any auto-mobile dealer that there's money in selling Vesta Bat-teries and there's no "grief." STORAGE BATTERY We say we can prove it. Ask us to do it.

Vesta Battery Corporation

Chicago, Ill., U. S. A.

The new Columbia selling agreement incorporates those features interesting to successful dealers. You are invited to investigate.

COLUMBIA MOTORS CO.

Address Dept. "B"

Detroit, Mich.

POWERFUL -SAFE -"DICKERSON" TURNTABLE JACK

dies all cars for all kinds ork. Great for spring and dis repairs. Saves time— as money for yos. Priced HT. Write for catalog.

C. A. DICKERSON COMPRESSOR CORP. Buffalo, N. Y.







THE

QUALITY—PROFIT—TURNOVER

American ammered Piston Rings

American Hammered Piston Ring Company Baltimore, Maryland



FOLBERTH

FOLBERTH WINDSHIELD CLEANER

A good profit for you in this wonderful, fast-selling necessity. Ask your jobber or write.
AUTO SPECIALTY CO., CLEVELAND

KENT

The World's Highest Grade Ignition, Starting & Lighting. PHILADELPHIA, PA 4957 STENTON AVENUE



Heat shaped to in-sure perfect round-ness, sold at almost the price of a snap

the price ring.
Wilkening Mfg.
Company
15th and Mt. Ver-non St., Philadel-phia, Pa.



ELGIN QUALITY PISTON PINS

Regular, Oversize, Orphan Shipped Same Day

ELGIN MACHINE WORKS

Elgin, Ill.

"It pays to buy a Kellogg"

OMPRESSOR:

ROCHESTER, NEW YORK

REPAIRMEN

source of profit!
Send us your rewind jobs, are "Armature Winding Spelists."

lists."

Profit for you in our service. Ford generator armsture rewound—\$1.95. Other prices in proportion. All work guaranteed. Write for catalog and prices on prices in proportion. All work summaries all generators.

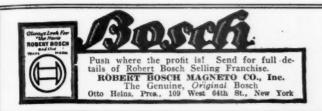
H. M. FREDERICKS CO., Lock Haven, Pa., U. S. A.





1924

R





IT'S EASY TO SELL

"The only oil ring with a mileage guarantee" "Say-Oil" is stamped on bottom of every ring

The Sav-Oil Ring Mfg. Co. 1037 S. Figueroa St., Los Angeles



Send U. S. Your Armature Repair Work

FORD ARMATURES REWOUND



MOST ANY TWO UNIT GENERATOR ARMATURE

ALL WORK GUARANTEED-WRITE FOR PRICE LIST U. S. AUTO SUPPLY CO., 3845-49 S. WABASH AVE., CHICAGO



Spring-steel, Oil-tempered Bumpers in Six Complete Styles. Guaranteed Satisfactory Attaching Arms for all Leading Makes of Cars. We invite comparison in appearance, quality and price. THE BELLEVUE MANUFACTURING CO., Bellevue, Ohio



ALVORD QUALITY TOOLS



Taps, Dies, Cutters, Drills, Reamers Send for Catalog ALVORD REAMER & TOOL COMPANY Millersburg, Pa.

ERY SERVICE EQUIPM Test Set Rectifier FOREST ELECTRIC COMPANY New and Wilsey Streets NEWARK, N.



The Aristocrats of Motordom

7 Models-Open and Closed Distributors in principal cities. Open territory now being closed.

Kissel Motor Car Co. Hartford, Wis.



So powerful that the combined strength of three mean could not "stall" it when drilling ½" holes in steel. Write for miniature catalog describing the complete line of Petersen Portable Electric Tools.

A. H. PETERSEN MFG. CO., 1616-24 Fratney, MII.WAUKEE



Kokomo Long Life tires and tubes make money for dealers who handle them.

Kokomo Twin-Grip Fabrica Kokomo Two-Grip Corda Kokomo Everlaster Red Tubes Kokomo Standard Gray Tubes

KOKOMO RUBBER CO., Kokomo, Indiana 131 South Main St.



For Ford Replacements The finest quality hand blown triple strength crystal sheet glass cut to exact size and finished on one edge. Packed in a manner that minimizes breakage. Jobbers and dealers can carry stock with little chance of damage. Write for complete details.

PORTER MIRROR & GLASS CO., Fort Smith, Ark. Automotive Division—3124 Locust Blvd., St. Louis, Mo.



NO-LEAK-O PISTON RINGS
Won't Leak Because They're Sealed With Oil
No-Leak-O Piston Rings are making money for dealers everywhere. Their "oilsEaLing" groovefound only in No.-Leak-O-packs an oil film in between piston and cylinder walls like "packing" in a pump. Oil and gas stay where they belong.
National advertising is helping the dealer sell No-Leak-O. It will pay you to stock No-Leak-O at once.

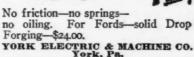
Price 35c and up

NO-LEAK-O PISTON RING CO., Dept. 376, Muskegon, Mich.

Store fronts

Write for Special Book Garage Fronts THE KAWNEER CO., 1219 Front St., Niles, Mich.

Pulls Car Over Rough Spots







Home Plant, Fort Wayne, India

Cold-

Drawn

Sockets



Welco Accelerator





The Allen Manufacturing Company, Hartford, Conn.



HOESS

The Humanized Ring

Combines the simplicity of the one-piece ring with the snug fit and oil-scraping ability of more complicated designs. Good profit and fine results. Write for prices and discounts.

HOESS BROTHERS

Hammond, Ind.



INSHIELD

INSIDE THE WINDSHIELD-NO GLASS TO CUT

I N S H I E L D 4½ in. diameter. Heavy Nickel or Black Enamel. Made of heavy sheet brass. 21 c. p. Mazda precision type tipless bulb, silver, triple-plated reflector \$7.50

INSHIELD SENIOR

5½ in. diameter. Nickel
finish only. Simplest and
best inner-controlled driving light made.

ALLEN

Wrench

The Inshield Products Co., Toledo, Ohio Formerly the Thal & Bitter Machine Co.





THE AMERICAN FLATLITE CO., Cincinnati, Ohio



Manufactured by SPEED-O MULTIPLE VALVE LIFTER CORP. 1926 Broadway, New York



DOUBLE YOUR FORD SELLING FIELD

Two-Ton Capacity-High Speed Ask your nearest distributor to demonstrate it or write us.
THE WARFORD CORP., 44 Whitehall Street, New York



EVER STEP

PISTON RINGS Interlocking joint eliminates all filing, fitting a low price; lathe turned individually gauged.

Priced to be profitable to dealer and jobber.

ROYAL PISTON RING CO., INC., BATH, N.Y.



Real High Tension Ignition for Ford Cars

Varley Transformers eliminate nearly all chronic ignition trouble. Save gas. Add power Keep plugs clean. Stop misfiring. Save repairs. \$2.50 each.

The Autocoil Co., Jersey City, N. J.



RED GIANT RIM TOOL

The name "RED GIANT" is a guarantee of satisfaction. Known and used in the ma-jority of the civilized world. If your jobber cannot supply you write direct.

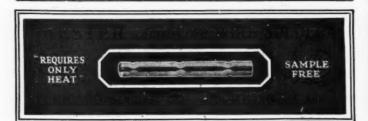
> RED GIANT TOOL CORP. Lynchburg, Va.

Here at last is a battery tester of very finest quality. It is absolutely guaranteed to be accurate—every instrument must pass the two-point test. Green ribs of celluloid make sticking of float impossible. Write for details.

N & N HYDROMETER CO.

3715 W. Grand Ave., Chicago

Johns-Manvi **NON-BURN** ASBESTOS BRAKE LINING



The MINUTE \$250

Greatest clock value ever offered the trade. Accurate —handsome—guaranteed by one of the largest manufacturers of auto clocks. Protected against vibration. Regulated without dismantling dash. Great seller. Price in Canada \$3.50.

The LIDE CLOCK MANUFACTURING CO. INC.





1924

ing of

nd ts.

ıd.

The SPOTLIGHT

WILL FIND WHAT YOU WANT

PARTS and REPAIRS

WRITE US FIRST!

Save Time and Money

We carry a complete line of Automobile Parts

Transmissions (all kinds)
Cylinder Blocks Magnetos (a

Cylinder Blocks Magnetos (all kinds)
Drive Shafts Carburators
New Gears (all kinds) Starters
Used Gears (all kinds) Rear Ends

400 Motors of all kinds in stock at all times

BENNETT BROS.

Largest Auto Wreckers in the Country
Grant and Water Sts. Pittsburgh, Pa. Mail Orders Given Prompt Attention

COMPLETE STOCK

New and Used Auto Parts, Accessories and Supplies, for all make and models of cars.

CADILLAC "57" MOTOR COMPLETE or any part of same

same.
FENDERS for all Cadillac models.
MERCER MOTOR COMPLETE with U. S. L.

Starter.
FOHRMAN BROS. AUTO PARTS COMPANY
2344 South State St., Chicago, Ill.

AUTO Save 50 - 90% PARTS

NEW AND USED GEARS. AXLES, BEARINGS, SPRINGS, MAGNETOS, GENERATORS, ETC. JOB-BERS IN BANKRUPT AUTO SUPPLIES.

BRIGHTMAN AUTO EXCHANGE

Windsor Ave.

HARTFORD, CONN.

ANY PART

ANY CAR NEW USED

Send for Catalogue Cincinnati Auto Parts & Wrecking Co. 712-714 Walnut St. CINCINNATI, OHIO

Parts our middle

AUTO PARTS

SAVE 50% TO 75% ON ALL CARS

New and Used Gears—Springs and Axles—Cylind

Motors—Rear Systems, etc. Wire or Write INDIANA AUTO PARTS CO.
316-18 NO. ILLINOIS ST., INDIANAPOLIS, IND.
LARGEST CAR WRECKERS IN INDIANA

DOWMETAL PISTONS Lighter, stronger, and longer wearing than aluminum or iron. Can be fitted with bronze bushings in the wrist pin holes same as in iron pistcns. Downetal has no permanent growth. The expansion is little more than iron.

SEND FOR PARTICULARS

LAMMERT & MANN CO.
Cylinder and Crankshaft Grinding
215-21 N. Wood St. CHICAGO Phones West 4918

NEW AND USED AUTO PARTS

We have wrecked over a thousand cars.

SANDER BROS. AUTO WRECKING CO. WEST POINT,

JANSEN FLY WHEEL GEAR RINGS

None better at any price. New price list just out.

JANSEN MACHINE COMPANY Des Moines, Iowa

.

INFORMATION

Six cents a word is the rate for all undisplayed advertisements set solid, regular want ad style; all capitals, 9c. a word; all capitals leaded, 12c. a word; minimum charge \$1 an insertion; payable in advance (see next paragraph).

Ten per cent discount if one payment is made in advance for four or more consecutive inser-tions. Advertisements other than "Positions Wanted" will be billed monthly if run more than

Add five words for address if replies are to come to a box number address at any of our offices. These replies are forwarded each day as received, in new envelopes, at no extra charge.

Refund will be made if all insertions ordered are not needed, the amount refunded being the difference between cost of insertions given and full amount paid.

Telephone orders must be confirmed in writing same day. No allowances can be made for errors of any kind unless prompt notification is sent us.

When replying to blind ads be careful to put on your envelope the correct box number and do not enclose original letters of recommendation—send copies.

Displayed advertisements are sold by the inch. Rates will be furnished upon application.

The right is reserved to refuse any advertisement and also to rewrite and edit copy furnished whenever the publishers consider it advisable to do this.

SPOTLIGHT DEPARTMENT THE CLASS JOURNAL COMPANY

239 W. 39th St., New York 5 S. Wabash Ave., Chicago

PARTS and REPAIRS

WHAT DO YOU NEED? We have it. Gray's Auto Parts Company, 3212 Brighton Road, Pittsburgh, Pa.

PATENTS and PATENT ATTORNEYS

OKLET FREE
PROMPTNESS ASSURED BEST RESULTS
Send drawing or model for examinating
and report as to patentability
WATSON E. COLEMAN, Patent Lawyer
644 G Strock, N. W. Washington, D. C.

Attorney-at-Law and Solicitor of Patents
C. L. PARKER

Formerly Member Examining Corps., United
States Patent Office
American and foreign Patents secured. Searches made
to determine patentability and validity. Patent suite
conducted. Pamphlet of instruction sent upon request.
McGill Building, WASHINGTON, D. C.

MISCELLANEOUS

NOTICE RECEIVERS SALE HOUSTON, TEXAS APRIL 19, 1924

Entire Assets Southern Motor Mfg. Association, Ltd.

Notice is hereby given that scaled bids will be received until eleven o'clock a. m.. Saturday, April 19, 1924, for the assets of the Southern Motor Manufacturing Association, Ltd. of Houston, the said assets to be offered (1st) the entire stock of merchandise consisting in part of trucks, truck engines, trailers, wheels, tractor and passenger car parts, accessories, patent rights, accounts and bills receivable; (2nd) light and power plant equipment; (3rd) all machinery, equipment and tools; (4th) All factory buildings and land; (5th) lease of land located at 3416 and 3418 McKinney Arenue, Houston, together with buildings thereon situated; (6th) entire assets and property, except Liberty Bonds, cash and unexpired insurance.

Each bid must be accompanied by cashier's check payable to Ed. F. Dupree, Receiver, for an amount count to 15% of the bid, provided no one bidder shall be required to enclose a sum in excess of \$19,000.00; said cashier's check to be forfeited as liquidated damages in the event the bidder fails to comply with the terms of the sale.

The bids to be opened in the Court room of the subject to the approval of the Court, The right to reject any and all bids is reserved.

Sales to be made free of all liens except unpaid taxes. The plant will be open for inspection until April 19, 1924, and any information will be furnished upon application to the undersigned.

E. F. DUPREE, Receiver,

E. F. DUPREE, Receiver,
Southern Motor Manufacturing Association, Ltd.,
1003 Congress Avenue,
Houston, Texas

FOR SALE—Basic Patent. Efficient, three-way movement, controllable automobile head light device, suitable for all standard automobiles. Makes night driving safe and satisfactory. Always clear vision of roadway, without blinding on-coming driver. F. G. GAUNTT, Fort Wayne, Indiana.

FOR SALE—Authorized electric service station and arage in a city in Connecticut. Will sell at inventory on count of health. Address Box 6124, care MOTOR AGE, So. Wabash Ave., Chicago, Ill.

FOR SALE—Cheap, New Fairbanks-Morse burning-in machine for Ford motors. Also 35 ton hydraulic press. M. A. Schaaf, Eau Claire, Wis.

FOR SALE—5 Gal. Wayne Gasoline Pump, 500 Gal. Tank. Used very little—\$250.00. A. H. Fash & Son, Farmington, Ill.

SITUATIONS WANTED

AS EXPORT MANAGER OR FACTORY REPRESENTA-TIVE. Advertisor long connected with Detroit Manufac-turer of well known car desires change. Exceptional ex-perience in export and good following among foreign dealers. Box E-6122, care of MOTOR AGE, 5 So. Wabash Ave., Chicago. III.

a word for Spotlight ads to help you. To find men or employment. To sell surplus parts or machinery. To locate business opportunities.

Have you tried Spotlight Service?

Kelso

King Kisse Koke Koke

Lou

For Every Car and Job

A small stock of Snap-ons is enough to handle inquiries for socket wrenches for any job on any car. "What Car Do You Drive?" Book picks the right ones for you — no knowledge of wrenches or cars needed. Write today for details.

MOTOR TOOL SPECIALTY CO.

14 E. Jackson Blvd., Chicago

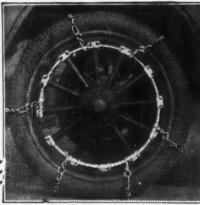
SNAP-ON WRENCH CO., Mfrs.

Milwaukee, Wisconsin

Snap-on

Socket Wrenches

Travelon NON-SKID ATTACHMENT

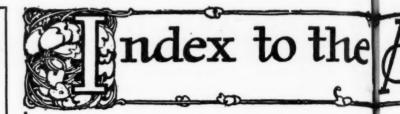


It's So Simple

The rings are attached permanently to the spokes. They cannot rust. The chains have snaps on their ends. They just snap onto the rings. There is plenty of space for them to travel; they can't damage tires. In deepest snow or mud, just snap the chains on or off without soiling clothes. No jacking up. That's what makes Travelon sell, and Gosh! how it sells!

Write and find out.

THE SHAW-WALTON CO.
PONTIAC, ILLINOIS



The Advertisers' Index is published as a convenience and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

A. C. Spark Plug Co
Auto Spring Control Co
Badger Rubber Works 88 Bassick Mfg. Co. 115 Bastian-Blessing Co. 104 Bearings Co. of America 136 Bell Mfg. Co. 128
Bellevue Mfg. Co
Bonney Forge & Tool Works104 Bock Bearing Co
Burrell Tech. Supply Co
C. & G. Wheel Puller Co138 Case, J. I., T. M. Co143 Chamberlain, Percy, Associates, Inc141
Champion Spark Plug Co
Cole Battery Sales Corp. 138 Cole Motor Car Co. 7 Colonial Gear & Mfg. Co. 141 Columbia Motors Co. 142 Comfort Printing Spec. Co. 120 Conneaut Packing Co. 140 Continental Sales Co. 104 Cooper Mfg. Co. 66 & 67

Corcoran Mfg. Co., The		
Dalton & Balch 140 Detroit Carrier & Mfg. Co. 142 Dickerson, C. A., Compressor Corp. 142 Dill Mfg. Co. 133		
Du Pont De Nemours & Co., E. I70 & 71 Durant Motors, Inc		
Eastern Mach. Screw Corp. 141 Eaton Axle & Spring Co. 140 Elgin Machine Works. 142 Elite Mfg. Co. 124		
Fafnir Bearing Co 80		
Feasel's, H. L., Laboratory138		
Federal Pressed Steel Co		
Fitzgerald Mfg, Co142		
Flower City Spec. Co		
Forest Floatric Co142		
Forest Electric Co		
Fredericks, H. M., Co		
G. H. Tension Ring Co132		
Gabriel Mfg. Co113		
Gardner Motor Co., Inc		
Gasco Mfg. Co		
Gates Rubber Co		
Gemeo Mfg. Co141		
General Storage Battery Co136		
Gilliam Mfg. Co., The		
Goodrich, B. F., Rubber Co 1		
Green Engineering Co., The135		
Hall Cylinder Hone Co112		
Harvey Spring & Forging Co 94		
Harvey Spring & Forging Co 94 Hayes Wire Wheel Co110		
Hobart Bros. Co		
Hayes Wire Wheel Co. 110 Hobart Bros. Co. 140 Hoess Brothers 144 Hollenden Hotel 131		
Hayes Wire Wheel Co. 110 Hobart Bros. Co. 140 Hoess Brothers 144 Hollenden Hotel 131 Holley Carburetor Co. 141		
Hayes Wire Wheel Co. 110 Hobart Bros. Co. 140 Hoess Brothers 144 Hollenden Hotel 131 Holley Carburetor Co. 141 Holmes, Ernest, Co. 116		
Hayes Wire Wheel Co. 110 Hobart Bros. Co. 140 Hoess Brothers 144 Hollenden Hotel 131 Holley Carburetor Co. 141 Holmes, Ernest, Co. 116 Huetter Mach, & Tool Co. 141 Hydraulic Brake Co. 148		
Hayes Wire Wheel Co. 110 Hobart Bros. Co. 149 Hoess Brothers 144 Hollenden Hotel 131 Holley Carburctor Co. 141 Holmes, Ernest, Co. 116 Huetter Mach. & Tool Co. 141		
Hayes Wire Wheel Co. 110 Hobart Bros. Co. 140 Hoess Brothers 144 Hollenden Hotel 131 Holley Carburetor Co. 141 Holmes, Ernest, Co. 116 Huetter Mach, & Tool Co. 141 Hydraulic Brake Co. 148		

Jacobs Auto Safety Lamp Co.,

Johns-Manville, Inc. ..

1924

.....133

.....147

......142 Ssor142

....139 Co., 0 & 71

.....140

.....142124

....138138

> 142 ...138

142

to 68

....113

.... 61 ..139

....102

141

....100

....135

... 94

...110

...140 ...144

...131

.141 ...116 ...141 ...148

...138 ol ...130 ...144

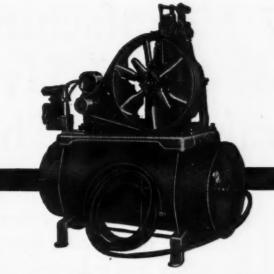
.144

..136105

vertisements

Johnson Bronze Co120 Johnson Gas Appliance Co136
Kawneer Co., The 143 Kellogg Mfg. Co. 104, 142 Kelso Mfg. Co. 92 Key Boiler Equip. Mfg. Co. 129 King Sewing Machine Co. 140 Kissell Motor Car Co. 143 Kokomo Automotive Mfg. Co. 68 Kokomo Elec. Co. 117 Kokomo Rubber Co. 143
Landis Tool Co
Manley Mfg. Co2nd Cover, 104 Mattman & Sinclair Co., The138 Maxwell-Chrysler 8 McQuay-Norris Mfg. Co
N. & N. Hydrometer Co
Oakes Co., The. 140 Oestern Mfg. Co., The. 131 Ohio Parts Co., The. 135 Olds Motor Works. 59 Oxford Varnish Corp. 85 Oxweld Acetylene Co. 104
Packard Motor Car Co. 139 Parkin, H., Magneto Co. 136 Peck Spring Co., The 134 Peerless Motor Car Co. 138 Petersen, A. H., Mfg. Co. 143 Pfaff Manufacturing Co. 137 Pines Mfg. Co. 139 Pioneer Armature Co., Inc. 137 Porter Mirror & Glass Co. 143 Prest-O-Lite Co., Inc., The 107 Price Brothers, Inc. 140
Quality Electrical Prod. Co130 Radiant Oil Co., Inc., of Ohio 69
- THE OF THE OF

Johnson Bronze Co120	Red Giant Tool Corp144
Johnson Gas Appliance Co136	Remington Automotive Corp 138
	Roach, R. N., Co132
Kawneer Co., The143	Rome-Turney Rad. Co138
Kellogg Mfg. Co104, 142	Rose, Frank, Mfg. Co
Kelso Mfg, Co 92	Royal Piston Ring Co144
Key Boiler Equip. Mfg. Co129	and a second and a second and a second
King Sewing Machine Co140	
Kissell Motor Car Co143	Sales Equipment Co., Inc141
Kokomo Automotive Mfg. Co 68	Savidge Shock Absorber Co130
Kokomo Elec. Co117 Kokomo Rubber Co143	Sav-Oil Ring Mfg. Co143
Kokomo Rubber Co143	Service Equipment Associates104
	Service Mfg. Co
Landis Tool Co109 Lasco Corp	Shaler, C. A., Co101
Las-Stik Patch Mfg. Co127	Shaw-Walton Co146
Laurel Motors Corp136	Sherer-Gillett Co123
Lavo Co. of Amer140	Snap-On Wrench Co146
Lorentzen Headlight Kontrol,	Speed-O-Multiple Valve Lifter
Inc142	Corp144
Louisville Electric Mfg. Co137	Spotlight Dept145
Lupton's, David, Sons Co103	Staff, J. Wadsworth118
Lux Clock Mfg, Co144	Steinberg Products Co140 Stevens & Co57, 104
Lycoming Metors Corp100B	Stewart-Warner Speed, Corp
	86 & 87
Manley Mfg. Co2nd Cover, 104	Stone Mfg. Co 73
Mattman & Sinclair Co., The138 Maxwell-Chrysler	Storm Mfg. Co139
McQuay-Norris Mfg. Co111	Studebaker Corp., The 5
Meachem Gear Corp141	
Mechanical Production Co127	T. N. T. Eng. Co100a, 100c
Mechanics Machine Co129	Thomson Mfg. Co134
Metal Stamping Co 1	Timken Roller Bearing Co142
Milwaukee Die Casting Co143	Toledo Mfg. Co., The124
Monarch Mfg. Co 98	Toledo Steel Prod. Co., The141 Tripp-Secord & Co140
Mossberg, Frank, Co104	Tyson Mfg. Co140
Motor Suit Mfg. Co118	Tyson Mig. Co
Mountain Accessory Co139	
Multibestos Co	U. S. Auto Supply Co143
manny number community a 10	United Mfg. & Dist. Co106
V	United States Air Comp. Co108
N. & N. Hydrometer Co144	Universal Industrial Corp 84
Nash Motors Co 6 National Lamp Works. Back Cover	Universal Industrial Corp 61
New Departure Mfg. Co137	
New Era Spring & Spec. Co134	Van Cleef Bros142
No-Leak-O Piston Ring Co143	Van Norman Mach. Tool Co104
Norlipp Co 72	Vesta Battery Corp142
Northwestern Chemical Co139	
Norwalk Auto Parts Co141	Walden-Worcester, Inc136
	Wall Pump & Compressor Co141
Oakes Co., The140	Warford Corp144
Oestern Mfg. Co., The	Watervliet Tool Co., Inc125
Olds Motor Works	Watkins Mfg. Co137
Olds Motor Works59	Watson, John Warren, Co
Uxiord Varnish Corn	
Oxford Varnish Corp	62 & 63
Oxweld Acetylene Co	Waukesha Motor Co
Oxweld Acetylene Co104	62 & 63
Oxweld Acetylene Co	62 & 63 Waukesha Motor Co
0xweld Acetylene Co	62 & 63 Waukesha Motor Co
0xweld Acetylene Co	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co. 104 Packard Motor Car Co. 139 Parkin, H., Magneto Co. 136 Peck Spring Co., The. 134 Pecrless Motor Car Co. 138 Petersen, A. H., Mfg. Co. 143 Pfaff Manufacturing Co. 137 Pines Mfg. Co. 130 Pioneer Armature Co., Inc. 137	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co. 104 Packard Motor Car Co. 139 Parkin, H., Magneto Co. 136 Peck Spring Co., The 134 Peerless Motor Car Co. 138 Petersen, A. H., Mfg. Co. 143 Pfaff Manufacturing Co. 137 Pines Mfg. Co. 139 Pioneer Armature Co., Inc. 137 Porter Mirror & Glass Co. 143	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co. 104 Packard Motor Car Co. 139 Parkin, H., Magneto Co. 136 Peck Spring Co., The 134 Peerless Motor Car Co. 138 Petersen, A. H., Mfg. Co. 143 Pfaff Manufacturing Co. 137 Pines Mfg. Co. 139 Pioneer Armature Co., Inc. 137 Porter Mirror & Glass Co. 143	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co	62 & 63 Waukesha Motor Co
Oxweld Acetylene Co	62 & 63 Waukesha Motor Co



Real Air Service in This Curtis

THE above illustration is the Curtis Style V Two-stage Outfit—one of the family of popular Curtis Outfits-the last thing in air compressor design—free of complicated parts —built for hard usage and will be on the job all the time. ¼ to 3 H.P.—automatic.

Single and Two-stage

Many Sizes and Styles

We manufacture a complete line of single and two-stage outfits. You are sure to find one that will meet your particular needs in style, size and price. Write at once for full information and descriptive literature. Use the coupon below, or a postcard will do.



Style "S" Single Stage Outfit, Belted only. Five

CURTIS PNEUMATIC MACHINERY CO. St. Louis, Mo. 1527 Kienlen Ave.

Branch Office:

530-H Hudson Terminal · New York City

USE THIS AIR COMP NES COUPON Gentlemen: Please send me full details on Curtis Air Compressors—your proposition and prices. Name.... Jobber's Name..... Address.....

27 Manufacturers Have Adopted Lockheed Hydraulic 4-Wheel Brakes For These Plain Reasons

The success of Lockheed Hydraulic 4-Wheel Brakes—one of the outstanding facts of the motor car industry—has already caused their adoption by 27 manufacturers.

The reasons are plain and powerful.

Lockheed Hydraulic Brakes are, unmistakably, by far the most simple, as well as the most effective brakes, ever put on a car.

They are entirely self-lubricating.

They are highly adaptable to production assembly.

Manufacturers who adopt Lockheed Hydraulic4-Wheel Brakes are secure in their patent rights; while, furthermore, they enjoy the advantage of the wide advertising which these brakes are receiving.

It is significant that Lockheed Hydraulics are the only brakes used on motor cars which differ in principle from the brakes first used by manufacturers of motor vehicles—a long since out-grown heritage of the horse drawn era.

They have been developed at an expense of hundreds of thousands of dollars to meet the need for greater decelerating ability, brought about by the building of greater speed into motor cars.

HYDRAULIC BRAKE COMPANY 5835 RUSSELL ST. DETROIT, MICH.

LOCKHEED

Hydraulic Four Wheel **Brakes**

One of the big outstanding features of Williams Accelerators is the spring steel control wire, operating in a flexible, shock-proof, rattle-proof brass tube.

This makes it possible for the foot to press on the comfortable Williams pedal and feed the gas to the motor with almost unbelievable smoothness.

This is just one of many exclusive, patented features found in the Williams "Regular" Accelerator at \$3.00—and the Williams "Junior" at \$1.50.

For easy profits, show Williams Accelerators to your Ford trade. They sell at sight and stay sold. Order your service stock of both models from your jobber today.

WILLIAMS BROS. AIRCRAFT CORP.

Secretaria de la constitución de 25th and Potrero Ave. San Francisco, California